ACCIDENT PREVENTION PLAN

OPERATION AND MAINTENANCE OF DUAL PHASE GROUNDWATER AND VAPOR TREATMENT SYSTEM

PEMACO SUPERFUND REMEDIATION SITE
5050 E. SLAUSON AVENUE
MAYWOOD, CALIFORNIA

Contract Number: DACA45-00-P-0163; Task Order T019

Prepared for:

SFUND RECORDS CTR
2278812

U.S. Environmental Protection Agency
Region IX
San Francisco, California

U.S. Army Corps of Engineers
Omaha District
Omaha, Nebraska

Prepared by:

T N & Associates, Inc.
Engineering and Science
317 E. Main Street
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August 2007

T N & Associates, Inc.
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Transmittal Letter

To: Ms. Rose Marie Caraway **Company:** U.S. EPA
Remedial Project Manager

Address: US-EPA Region IX
75 Hawthorne St.
San Francisco, CA 94105-3901

From: Dacre Bush
Date: **August 15, 2007**

Re: Accident Prevention Plan
Operation and Maintenance of Dual Phase Groundwater and Vapor Treatment System, Pemaco Superfund Site, Maywood, California

CC: John Hartley, USACE, Omaha District (1 Hard Copy)

☐ Urgent	☐ For Review	☐ Please Comment	☐ Please Reply	☒ FYI

Dear Ms. Caraway;

Attached please find one hard copy of the *Accident Prevention Plan for the Operation and Maintenance of Dual Phase Groundwater and Vapor Treatment System, Pemaco Superfund Site, Maywood, California, August 2007.* Please contact me if you have any questions.

Regards,
T N & Associates, Inc.

Dacre Bush

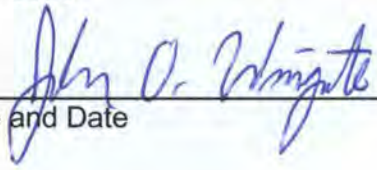
Dacre Bush
Senior Remedial Specialist
dbush@tnainc.com
805-295-9071

SIGNATURE SHEET

Approval of the Accident Prevention Plan

Plan Prepared by:

John Wingate, PE
TN&A Engineering Project Manager
(805) 585-6389

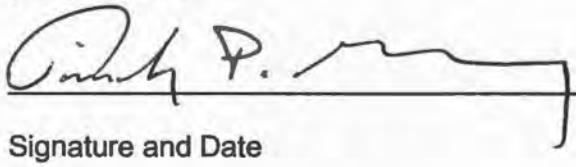


10 August 2007

Signature and Date

Plan Approved by:

Tim Garvey
TN&A Vice President, TN&A West Region Operations
(805) 585-6386

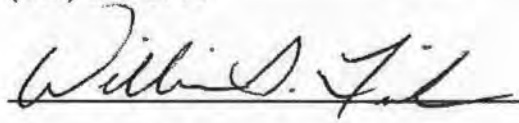


10 August 2007

Signature and Date

Plan Concurrence:

William S. Fink, CIH, CSP, CHMM
TN&A Corporate Health and Safety Manager/Associate
(414) 607-6779



10 August 2007

Signature and Date

Effective Dates: August 10, 2007 to August 10, 2007

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ACRONYMS AND ABBREVIATIONS

ACGIH	American Conference of Government Industrial Hygienists
AHA	Activity Hazard Analysis
APP	Accident Prevention Plan
CFR	Code of Federal Regulations
CHMM	Certified Hazardous Materials Manager
CIH	Certified Industrial Hygienist
CM	Construction Manager
CPR	cardiopulmonary resuscitation
CS	Construction Superintendent
CSHM	Corporate Health and Safety Manager
CSIR	Contractor Significant Incident Report
CSP	Certified Safety Professional
DOT	U.S. Department of Transportation
EHS	Environmental Health and Safety
EMR	Experience Modification Rates
EPA	United States Environmental Protection Agency
ERH	electrical resistant heating
FID	flame ionization detector
GAC	granular activated charcoal
GFCI	ground fault circuit interrupter
GTS	groundwater treatment system
HBV	hepatitis B virus
mg/m^3	milligrams per cubic meter
MSDSs	Material Safety Data Sheets
NA	not applicable
O&M	operation and maintenance
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PID	photoionization detector
PM	Project Manager
PPE	Personal Protective Equipment
PPE	personal protective equipment
ppm	part per million
PVC	polyvinyl chloride
SDLACIWS	Sanitation District of Los Angeles
SHM	Safety and Health Manager
SSHO	Site Safety and Health Officer
SVE	soil vapor extraction
TCE	Trichloroethylene
TN&A	T N & Associates, Inc.
UL	Underwriters Laboratories
USACE	U.S. Army Corps of Engineers
VFD	variable speed drive
VOCs	volatile organic compounds
VTS	vapor treatment system
WBGT	wet bulb globe temperature

1.0 BACKGROUND INFORMATION

1.1 CONTRACTOR INFORMATION

Contractor: T N & Associates, Inc. (TN&A)

Contract Number: DACA45-00-P-0163; Task Order T019

Project Name:

OPERATION AND MAINTENANCE OF DUAL PHASE GROUNDWATER AND VAPOR TREATMENT SYSTEM

PEMACO SUPERFUND REMEDIATION SITE
5050 E. SLAUSON AVENUE
MAYWOOD, CALIFORNIA

1.2 PROJECT DESCRIPTION AND SCOPE OF WORK

The remediation system described for work activities covered in this Accident Prevention Plan (APP) is an automated, vapor extraction and groundwater treatment system that has been designed to reduce the mass of volatile organic compounds (VOCs) primarily Trichloroethylene (TCE) present in soil vapor and groundwater a the site. The groundwater treatment system (GTS) and vapor treatment system (VTS) are designed to operate independently of each other. The remediation system is located within a steel frame building with a 4-inch concrete containment berm to contain any possible spills or leaks.

The GTS is comprised of a groundwater booster tank, T-401 with a transfer tank, P-401, a 10-micron multiple bag filter housing, F-401 with a single bag filter bypass., F-402, a holding tank, T-402 with a variable speed drive (VFD) transfer pump, P-402 with a second set of 10 micron single bag filters, F-403 and F-404 and two 3,000 lb liquid phase carbon adsorbers.

After the carbon adsorbers, there is a discharge flow totalizer, FQI-402 and a discharge sampling box, T-405 prior to discharge to the sanitary sewer.

Groundwater is extracted from the subsurface using down-well pneumatic submersible pumps. Thirty-three fluid pumps will extract groundwater from exposition zone extraction wells. Electrical resistant heating (ERH) will be performed using 58 electrodes in the areas of highest TCE impact. Soil vapor extraction (SVE) will be conducted concurrently to remove contaminated soil vapor. Piping from the extraction wells is below ground, while piping in the treatment plant is above ground. The remediation system will separate the condensate from extracted vapors and treat the removed condensate and groundwater using liquid phase carbon adsorbers, T-0403 and T-404, operated in series prior to discharge to the sanitary sewer. Sanitation District of Los Angeles County, Industrial Waste Section (SDLACIWS) sampling requirements are performed in accordance with the respective permits to operate. Treatment of the contaminated soil vapors will be conducted concurrently with groundwater extraction, but the VTS will be able to run independently of the GTS.

A map of the jobsite is included as Figure 1.

1.3 CONTRACTOR ACCIDENT EXPERIENCE

Refer to Appendix D for TN&A EHS Performance Summary, including Experience Modification Rate (EMR), injury and illness incident rates, DART incident rates, etc., also attached is the TN&A 2006 OSHA Form 300A Summary of Work-Related Injuries and Illnesses, and the TN&A corporate trend analyses.

1.4 LISTING OF PHASES OF WORK AND HAZARDOUS ACTIVITIES REQUIRING ACTIVITY HAZARDS ANALYSES

Certain work activities are recognized as inherently more hazardous than others. For these operations, a detailed activity hazard analysis (AHA) will be conducted for each associated work task that specifies corrective actions to be taken to control the hazard. AHAs will be produced, reviewed, and modified, as necessary, to address new work activities and changing site conditions as the work progresses. Work will not begin until the AHA for a given work activity has been accepted by client and discussed with all affected project personnel. The hazardous work activities for which AHAs have been developed include the following:

- Changing of Bag Filters
- Changing of Particulate Filters
- Cutting / Repairing Conveyance Piping
- Receiving Caustic Treatment Chemicals
- Cleanup of Caustic Spills
- Accessing Granular Activated Charcoal (GAC) Tanks
- Cleanup of Contaminated GAC Released During Changeout Activities
- Control of Hazardous Energy (Lockout Tagout) Activities
- Changing Elements on H202
    - General Site Tasks General to all Operation and Maintenance (O&M) Monitoring:
    - Specific issues associated with filter replacement on silencers associated with air dilution valves
- Operating Parameters
- Wellhead Monitoring in the Street
- Wellhead Monitoring On-Site
- Groundwater Pump Removal
- FTO Core Changeout

These AHAs are found in Appendix A.

1.5 SCOPE AND APPLICATION OF ACCIDENT PREVENTION PLAN (APP)

This APP addresses the health and safety practices and controls that will be implemented by all TN&A employees and its subcontractors participating in the O&M of the Groundwater and Vapor Treatment System project at the Pemaco Superfund Site. Activities performed under this APP will comply with applicable sections of 29 CFR 1910 and 1926 and the U.S. Army Corps of Engineers' (USACE) Safety and Health Requirements Manual (EM 385-1-1). In addition, select work practices and procedures from TN&A's Corporate Health and Safety Program will be incorporated into this plan by reference. Copies of these procedures will be available at the jobsite. Modifications to the APP will be reviewed and approved by TN&A's Project Manager (PM) and Corporate Safety and Health Manager (CSHM).

TN&A and its subcontractors do not guarantee the health or safety of any person entering the project site. Because of the nature of the project and the activities occurring thereon, it is not possible to discover, evaluate, and provide protection for all possible hazards that may be encountered. Strict adherence to the safety and health guidelines set forth herein will reduce, but not eliminate, the potential for injury at this site. The safety and health guidelines in this plan were prepared specifically for this site and should not be used on other projects.

2.0 STATEMENT OF SAFETY AND HEALTH POLICY

The following is excerpted directly from the TN&A Corporate Safety and Health Manual, Section 2.0 – Safety Policy:

2.0 SAFETY POLICY

2.1 Policy Guidelines

It is a fundamental principle of T N & Associates, Inc. that no job is so important and no service is so urgent that we cannot take time to perform our work safely. The Company is committed to providing a safe and healthful working environment. In all operating decisions, safety shall be the first and major consideration. We are committed to ***ZERO ACCIDENT PERFORMANCE*** *and are dedicated to* ***SAFETY EXCELLENCE****. No operation shall be carried out at any site until safety is assured.*

The Company is dedicated to the concept that all accidents are preventable. Accordingly, the Company is committed to achieving and sustaining ***"Zero Accident Performance"*** *through continuous improvement practices.*

The Company expects all employees, especially supervisors, to make every practical effort to prevent injuries. The Company believes that it is the responsibility of each individual to observe all safety regulations and to use good safety practices at all times. Our safety efforts must be cooperative in nature, and this cooperation is required for maximum results from our Safety and Health program.

2.2 Corporate Responsibility

To protect employees from job-related injuries or illnesses and to promote a safe and healthful work environment, the Company management at the corporate level will:

- *Maintain an active Safety and Health Program for all employees;*
- *Maintain a continuing education program to inform and train employees in safe work practices and procedures and to maintain employee interest in the Safety and Health Program;*
- *Insist on compliance with safety rules, regulations, practices, and the use of prescribed safety equipment by all employees;*
- *Maintain the programs and training necessary to comply with applicable government regulations;*
- *Support an active SH member at each site to plan and take part in the safety and health program;*

- *Foster an environment of continuous improvement by measuring performance metrics and soliciting on safety performance input from workers, supervisors, SSHO's, and SH professionals.*
- *Encourage the use of safety incentive and motivational programs to encourage employees to work safely and develop safe work habits;*
- *Conduct regular safety inspections to find and correct unsafe acts and conditions;*
- *Document and investigate all "near miss" incidents to determine root causes and refine work practices;*
- *Investigate all accidents to prevent a recurrence, and file a written accident report on all OSHA recordable injuries or illnesses;*
- *Provide training and ensure the use of appropriate personal protective equipment (PPE) and safeguards where required to promote employee health and safety;*
- *Provide adequate First Aid or medical facilities for treatment of job-related injuries or illness; and*
- *Insist on a high standard of housekeeping at all sites at all times.*

3.0 RESPONSIBILITIES AND LINES OF AUTHORITIES

To meet the TN&A corporate goal of **Zero Incidents and Safety Excellence** and to ensure that the work is conducted in a safe and healthful manner, the Project Team has developed a line of reporting and has tasked individuals with the following safety and health responsibilities.

3.1 ENGINEERING PROJECT MANAGER (PM)

The PM, Mr. John Wingate, PE, will be the direct point of contact for the issues relating directly to the engineering and O&M systems operation aspects of the project. He will function as the immediate supervisor of the Site Manager/SSHO at the project site. He will administer the subcontracts required for the successful completion of the project and will be responsible for invoicing and other administrative functions directly related to the project.

Mr. Wingate will visit the site as needed and attend important project meetings. He will assist the SSHO/QC Inspector with enforcement and application of the APP and QC Plan at an authority level above the site project team. He will monitor the progress of the "work" and offer assistance when and where ever needed. Mr. Wingate is based out of the Ventura, CA office.

3.2 CORPORATE SAFETY AND HEALTH MANAGER

William S. Fink, CIH, CSP, CHMM is the Safety and Health Manager (SHM) for the project. He is responsible for the development, implementation, oversight, and enforcement of this APP. He is available to provide consultation, as needed, on health and safety issues that may arise during the project and to ensure the APP is fully implemented. The SHM will coordinate any modifications to the APP with the PM and the Contracting Officer and approve APP amendments for specific site tasks. The SHM will also review accident reports and results of daily inspections as well as coordinate policy or procedure changes that may impact the project with the PM.

3.3 SITE MANAGER/SITE SAFETY AND HEALTH OFFICER (SSHO)

The O&M System Site Manager and Site Safety and Health Officer (SSHO) is Mr. Mark Prostko. He reports directly to the Engineering Project Manager. He will assist the SHM with on-site training and with the implementation and enforcement of the APP. He will also be responsible for the daily implementation and enforcement of the QC Plan. Mr. Proskto is based out of the Ventura, CA office and will be on-site full time during all phases of the project. He will conduct initial site-specific training and ensure compliance with APP requirements including federal, state, and OSHA regulations. Mr. Prostko will be responsible for daily implementation and enforcement of the APP. He will conduct the daily "toolbox" safety meetings and perform the Preparatory, Initial and Follow-up Quality Control Inspections.

Mr. Prostko has authority to stop work if unacceptable safety or health conditions exist and take necessary action to re-establish and maintain safe working conditions. He will consult with and coordinate any modifications to the APP with the SHM, Construction Supervisor (CS), and PM. He will also serve as a member of the contractor's quality control staff on matters relating to safety and health. He will conduct accident investigations and prepare accident reports. The

SSHO will review results of daily quality control inspections, complete exposure data, and document safety and health findings in the daily reports.

In coordination with site management and the SHM, the Mr. Prostko will recommend corrective actions for identified deficiencies and oversee corrective actions. He will provide continued support for upgrading/downgrading the level of PPE. He will be responsible for evaluating air monitoring data and recommending changes to engineering controls, work practices, and PPE.

The SSHO will have current certification in First Aid / CPR and maintain documentation of this training in the project files.

3.4 VISITORS

Only visitors authorized by the SITE MANAGER/SSHO will be allowed to enter the work area. Prior to entering work areas, visitors will read, understand, and sign the Accident Prevention Plan as per the APP Compliance Agreement found in Appendix E and wear personal protective equipment specified in the APP and by the SSHO. Visitors must also report recognized unsafe conditions and actions in addition to any accidents, exposures, near misses, or property damage to the SITE MANAGER/SSHO. Visitors must follow the direction of the SITE MANAGER/SSHO. Visitors that are not physically working on treatment system components will be accompanied by the Site Manager at all times. The only authorized non-working visitors allowed at the project site will be persons escorted to the site by Ms. Rosie Caraway of the U.S. Environmental Protection Agency (EPA).

4.0 SUBCONTRACTOR AND SUPPLIERS

All subcontractors and craft labor have the responsibility to report any unsafe conditions and actions, accidents, exposures, near misses, or property damage immediately to the SITE MANAGER/SSHO. They will also comply with all project health and safety work requirements and applicable Occupational Safety and Health Administration (OSHA) regulations. They will read, understand, and sign the APP and wear all specified PPE. They also will inform the SITE MANAGER/SSHO of any prescription medication taken during the project that has the potential to cause drowsiness or otherwise adversely impact work performance.

The Site Superintendent and SITE MANAGER/SSHO will coordinate with various subcontractors coming on-site to provide initial safety briefing, ensure all personnel understand and sign the APP Compliance agreement, and participate in all daily tailgate safety briefings.

Suppliers coming on-site will be met by the CS or the SITE MANAGER/SSHO and directed to the areas of the site to make deliveries. Delivery personnel will be strictly limited by the SITE MANAGER/SSHO and under the direct supervision of the SITE MANAGER/SSHO while on-site.

There will be a handful of specialty subcontractors that will assist TN&A with the successful execution of the project.

The primary site work subcontractors are listed as follows:

- TRS: Operating the system remotely and making periodic O&M inspections.
- Clevenger Construction Co.: Occasional earthwork, fencing, vault, retrofits.
- QED Environmental: Occasional well pump O&M
- Almega Environmental, Inc. (the lab): Vapor analytical testing
- Prominent Inc.: Carbon supplier
- American Compressor Co.: Compressor maintenance.
- Eversoft Water Inc.: Salt supplier
- HazMat Trans. Inc.: Waste hauler

4.1 COORDINATION AND CONTROL OF SUBCONTRACTORS AND SUPPLIERS

The PM and Site Manager will coordinate with Subcontractors to ensure that all contractual requirements have been met, security submittals have been made and the site is ready for them prior to them arriving at the site. The PM and Site Manager will ensure that the subcontractors arrive prepared to work by making sure that all of their required health and safety paperwork is in order and materials have been submitted and approved prior to them arriving on the site.

Subcontractors and suppliers that fail to perform or conduct themselves in an acceptable manner will be dealt with according to the provisions of their respective contracts and/or purchase orders. Workers will receive verbal and then written warnings if they fail to adhere to safety procedures

and protocols established in this APP and the USACE Safety and Health Requirements Manual (EM 385-1-1, 3 Nov 2003).

After one verbal warning of a major infraction (i.e. one that could lead to serious injury to the person or co-workers, the public, environmental releases or physical damage to the plant equipment) a second infraction would be grounds for removal from the site.

For less serious infractions, a verbal and a written warning will be issued. However, another infraction of any type would be grounds for removal from the site.

Suppliers (i.e. truck drivers) that are unsafe or fail to follow direction from site personnel will be asked to leave the site and their respective supervisors will be informed that these offenders are no longer welcome at the site and their access will be denied.

4.2 STOP WORK AUTHORITY

The Site Manager/SSHO and PM will have the authority to make on-the-spot revisions to the APP and stop work if an imminent hazard is discovered. The foreman or on-site supervisor for Maverick will also have the authority (and responsibility) to stop work is an imminent hazard is discovered.

The plant O&M staff will have the authority (and responsibility) to stop work if an imminent hazard is discovered.

Work will resume only after the hazard has been ameliorated or eliminated.

5.0 TRAINING

5.1 SITE-SPECIFIC ORIENTATION TRAINING

The Site Manager/SSHO will provide and document site-specific orientation training during the project kickoff meeting and whenever new workers arrive on-site. No site workers will be allowed to begin work until the site-specific training is completed and documented. This training will address this APP and all health and safety requirements and procedures pertinent to site operations.

As part of the site-specific orientation training, the following topics will be covered:

- Project introduction and orientation
- Potential site hazards (chemical, physical, and biological)
- Hazard communication for chemicals used on-site.
- Selection, use, and limitation of PPE
- Emergency procedures including provisions for medical facilities and obtaining medical treatment or emergency assistance.
- General safety and health policies and procedures
- Employee and supervisor responsibilities for reporting all accidents.
- Bloodborne pathogen briefing
- Content of the APP
- The Site Manager/SSHO will provide and document site-specific orientation training during the project kickoff meeting and whenever new workers arrive on-site.
- Review of AHA during the preconstruction meeting before any task is performed.

Those employees who must wear respirators while working in regulated areas will receive training in the selection, use, limitations, cleaning, and maintenance of the respiratory protective equipment they will use.

Documentation of a current respirator fit test and medical clearance for respirator usage is required to be on file for each employee.

The two plant O&M operators will be required to have current first aid/cardiopulmonary resuscitation (CPR) training.

The SITE MANAGER/SSHO will have completed OSHA's 10-hour construction safety class or equivalent within the last 3 years.

Confined space personnel will be trained in their respective roles and responsibilities as per 29 CFR 1910.146. A copy of the training completion certificates for each employee (including

subcontractors) working on the project will be maintained at the site. The aforementioned training requirements and other mandatory training and certifications required for this project are listed in Table 6.1 below.

Table 1 – Project Personnel Safety Training Requirements

Personnel	Requirements
All general site workers	Site orientation training Hazcom training for site chemicals Confined space, fall protection, and Scaffolding training, as applicable.
SITE MANAGER/SSHO	10-Hour OSHA Construction Course w/in past 3 yrs. First Aid/CPR training 24 Hr. formal safety training within past 5 yrs. 40 Hr OSHA HAZWOPER training with current 8-Hr refresher training 8 Hr. OSHA HAZWOPER Supervisor training Competent person training for Confined Space and Fall protection, as applicable
Plant O&M operators Subcontractor personnel: TRS: Operating the system remotely and making periodic O&M inspections. Clevenger Construction Co.: Occasional earthwork, fencing, vault, retrofits. QED Environmental: Occasional well pump O&M Almega Environmental, Inc. (the lab): Vapor analytical testing	First Aid/CPR with Bloodborne Pathogens training 40 Hr OSHA HAZWOPER training with current 8-Hr refresher training Competent person training for Confined Space and Fall protection, as applicable
Lockout/tagout authorized	Energy control procedure and lockout/tagout device removal [29 CFR 1910.147(a)(3), (4),(7) and 1910.147(e)(3)] and affected employees
Users of portable fire extinguishers	OSHA compliant fire extinguisher training, annually, [29 CFR 1910.157(g)]
Users of personal hearing protection and those enrolled in hearing conservation program	OSHA hearing conservation program and hearing protector use training [29 CFR 1910.95(i),(k)], annually
Forklift Operators	OSHA compliant forklift training / certification as per 29 CFR 1910.178.

Personnel	Requirements
Confined space workers	Permit-required confined space training as per 29 CFR 1910.146.
Users of fall protection	OSHA compliant fall protection training
Welders and Cutters	Trained in safe operation of their equipment, safe welding/cutting practices, and welding/cutting respiratory and fire protection. AIHA publication "Welding Health and Safety: A Field Guide for OEHS Professionals" is recommended, per EM 385-1-1, Section 10 – Welding and Cutting.

5.2 EMERGENCY RESPONSE TRAINING

Personnel on this project have not been trained as hazardous material responders and incident commanders; therefore, they will not respond to off-site releases of hazardous materials, structural or major fires, or other catastrophic incidents beyond their training and competency. Training during initial orientation, as well as periodic drills and reviews at each work area will include:

- Employee alarm system
- Evacuation procedures, routes, meeting places, and accountability
- Control of fuel sources
- Fire extinguisher education (No employee is permitted to attempt to fight a fire beyond incipient stage.)
- First aid, CPR, bloodborne pathogens for sufficient numbers of personnel
- Minor spill control/cleanup on-site. This may include source control (e.g., shutoffs, repositioning containers); containment (e.g., drum overpacks, sorbent booms, earthen dikes); and non-emergency cleanup (e.g., sweeping, digging, pumping, and containerization of spills and residues).
- Rescue operations as necessary.

An exercise (i.e., staged personnel injury or environmental spill incident) will be performed at the beginning of the project, and at least once per month. At the completion of the emergency response exercise, the SITE MANAGER/SSHO and PM will evaluate the effectiveness of the emergency response procedures. Results of the exercise will be documented and suggestions and comments will be annotated in the safety logbook. This Emergency Response Plan will be modified to include any changes necessary. Any changes must be coordinated with the PM and the SHM.

In addition, if the spill is small, site personnel will respond with a spill kit.

If a spill is catastrophic, that is, leaves the compound, the SSHO/SITE MANGER will call the Los Angeles Hazardous Material Response Unit, and 911 so that the area can be roped-off.

If the spill is noticed by the security guard, he will call Hector Cervantes and Mark Prostko, unless it is catastrophic, then the guard will call 911 first.

5.3 First Aid and CPR Training

At a minimum, two site workers per work shift will have received first aid and CPR training taught by a certified instructor and approved by an organization such as the American Red Cross. Site-specific briefings will include information about bloodborne pathogen hazards, and the SITE MANAGER/SSHO will keep a record of all site personnel having such training. Any TN&A employee and subcontractor employee involved in a bloodborne pathogen exposure incident will be offered a post-exposure evaluation consisting of prophylaxis and hepatitis B virus (HBV) immunization within 24 hours of exposure. Site personnel who have current first aid/CPR training will be posted at the office trailer and at each first aid station.

Type III, 10-unit first aid kits that comply with the criteria contained in ANSI Z308.1-1998 will be located in each site vehicle and work area. Bloodborne pathogen barrier kits containing latex gloves, CPR barrier, masks, and eye protectors, etc. will also be staged with the first aid kits. They will be inspected weekly and replenished as necessary.

5.4 Hazard Communication Training

A list of hazardous chemicals along with their associated Material Safety Data Sheets (MSDSs) will be kept on file for each hazardous chemical used during the project. These MSDSs will be made available to each employee on request. Employees will also be informed about any site operations involving the use of hazardous chemicals, the hazardous nature of the chemicals used, and the location of the MSDSs. Workers who may be exposed to hazardous chemicals will be trained to recognize chemical contact hazards in the workplace, the physical properties and health hazards of hazardous chemicals, and the personal protective measures that will be taken to control exposures. All chemical containers used to store hazardous chemicals will also be marked or labeled with the name of the chemical and its hazard warning.

5.5 Equipment and Tools

Any worker using a specific tool must have had training on the proper use of the tool. For tools having common experience in construction activities, a visual observation by a supervisor is sufficient to basically document that worker is knowledgeable of general trade tools (screwdrivers, hammers, pliers, wrenches, etc.). Workers operating heavy equipment must have specific training in operating that specific equipment. The supervisor must acknowledge in written form in the employee's training record that the employee is qualified to operate the equipment. However, training in operation of forklifts requires training specified in 29 CFR 1910.178, which includes re-certification on a periodic basis. A certificate of training in compliance with this regulation is required in the employee's training record.

5.6 Recordkeeping Requirements

All health and safety recordkeeping requirements mandated by 29 CFR 1926, and 29 CFR 1904 will be followed. These records include accident/incident reports, Weekly Safety Inspection

Checklists, Daily Tailgate Safety Briefings, health and safety field logbooks, safety deficiency tracking log, and MSDSs. Copies of pertinent forms are included in Appendix C.

5.7 SAFETY MEETINGS

Site safety briefings will be conducted prior to the start of work each day. During these sessions, each worker (subcontractors included) will be encouraged to share their observations, thoughts, and experiences on safety and health related issues pertinent to the jobsite. This venue also allows site management to share important hazard communication topics with the workers, such as plan-of-the-day activities and associated hazards and controls, required use of personal protective equipment, decontamination procedures, emergency procedures, safe work practices, and health and safety plan changes, to name a few.

The project supervisor and/or site health and safety supervisor will conduct these briefings at the start of each shift. Site briefings may be repeated during the day if new hazards arise which must be communicated to site personnel or if other workers arrive at the jobsite later in the day. A Daily Site Briefing form will be used to document these meetings and will include a listing of topics discussed, hazards identified, recommended remedial controls, other pertinent issues, and the names of all attendees. The information gathered in these session will be used to correct any unsafe conditions or work practices at the jobsite and amend the site health and safety plans as appropriate. Copies of Daily Site Briefing forms will be maintained at the jobsite. A copy of this form is included in Appendix C.

6.0 SAFETY AND HEALTH INSPECTIONS

The Site Manager/SSHO will conduct informal daily inspections of the jobsite. The results of these inspections will be recorded in the safety and health logbook. Formal safety and health inspections will also be conducted each week by the SSHO and every month by the Project Manager. Inspection results will be recorded on TN&A's work-site inspection form found in Appendix C. Copies of the inspection reports will be kept on file for review by the SHM.

Any deficiencies noted during these inspections will be recorded on a Deficiency Tracking Log which will be posted on the Safety Bulletin Board and updated daily. A responsible person will be assigned to correct each deficiency within a designated time period.

In accordance with the EM 385-1-1 (3 Nov 2003) Section 01.A.12 Inspections (d).

The Contractor shall establish a safety and occupational health deficiency tracking system that lists and monitors the status of safety and health deficiencies in chronological order. The list will be posted on the project safety bulletin board, will be updated daily, and will provide the following information:

(1) Date deficiency identified.
(2) Description of deficiency
(3) Name of person responsible for correcting deficiency.
(4) Projected resolution date
(5) Date actually resolved

6.1 INSPECTION PROTOCOL

Employees at field locations have the opportunity to prepare for inspections on a daily basis. TN&A places the burden of responsibility on all employees to make their work environment safe by correcting un-safe conditions on a daily basis. A complete set of inspection forms can be found in Appendix C.

6.2 CORRECTING UNSAFE CONDITIONS

All hazards discovered during an inspection or coming to the attention of TN&A must be corrected in a timely manner consistent with the seriousness of the hazard. All reasonable efforts should be made to abate recognized hazards as soon as possible and to advise employees of any uncorrected hazards. However, if there is an imminent danger of serious harm, an immediate corrective action, such as taking the piece of equipment or workstation out of service, is required. If an imminent hazard exists which cannot be immediately abated without endangering people/property, then all potentially exposed personnel will be removed from the area except those necessary to correct the hazardous condition. Employees correcting the hazardous condition shall be provided with the necessary safeguards. With regard to correcting unsafe conditions, the TN&A Site Supervisors and/or SITE MANAGER/SSHOs shall ensure the safety and health of their employees/guests by:

- Promptly correcting unsafe or unhealthy conditions;

- Setting a target date for correcting any hazard that cannot be immediately corrected and following up to confirm the hazard abatement;
- Utilizing the area inspection checklist or to track and document identified hazards and corrective measures;
- Providing interim protection to employees while the correction of hazards is proceeding;
- Informing area personnel of the status of the hazardous condition;
- Immediately removing/supporting the removal of any personnel exposed or potentially exposed to an imminent hazard; and
- Securing the resources (maintenance personnel, safety and health specialists, consultants) necessary to assess the hazard severity and recommend corrective action and abate the hazard.

7.0 SAFETY AND HEALTH PROGRAM EXPECTATION, INCENTIVES, AND COMPLIANCE

7.1 SAFETY AND HEALTH PROGRAM EXPECTATIONS

It is the goal of TN&A to achieve **ZERO INCIDENTS** on our projects and achieve **SAFETY EXCELLENCE**.

7.2 SAFETY AND HEALTH PROGRAM INCENTIVES

The TN&A. Safety Incentive Program consists of a Safety Promotions and Awards Program, which is described as follows:

A Team Leader or Project Manager can nominate a work group for a safety award to the respective Site Manager. The Site Manager then discusses the merits of the proposed safety award with the Corporate Safety and Health Manager. It is discussed why a work group deserves a safety award and the merits of that proposed award.

Each proposed award is evaluated on a case-by-case basis. The goals evaluated consist of the following:

- The number of hours worked with **zero** lost time accidents.
- The number of incidents on the project, including property damage incidents, equipment thefts, near miss occurrences, first aid cases, OSHA recordable cases (illnesses or injuries).
- Participation of the work group with Safety and Health Program Management including mandatory training programs and the medical surveillance program.
- Identifying unsafe conditions and implementing emergency response actions to abate conditions.
- Rendering first aid and assistance

Additional safety issues/criteria issues may be for above and beyond normal safety conditions or actions for example:

> *While working at the site the individual, John Doe, saw one of the contractors with XYZ Corp. cut their leg. "John Doe obtained the nearest first aid kit and additional towels to assist the injured worker and requested assistance from 911. John Doe proceeded to apply pressure and noticed the individual had signs of passing out proceeded to treat the injured worker for possible shock problems."*

Participation of the work group with Safety and Health promotion on the job, looking for continuous improvement of safety and health in the work process, adherence to the Site Safety and Health Plan for field work, holding tailgate safety meetings, weekly meetings, monthly meetings, forming a safety committee, requesting safety training videos and booklets from corporate library, and taking a pro-active and interest in safety and health across the board.

The proposed safety rewards may be available every quarter.

All these factors are considered in the evaluation. When it is found that a work group has met these goals it will be discussed with the Site Manager and the best type of Safety Award for the work group is decided. The Safety Award needs to reflect the safety performance goals of the work group.

Refer to Appendix D for a description of the "Safety Sentinel Program", wherein team members are nominated for awards for 'above and beyond" safety performance.

7.3 SAFETY AND HEALTH PROGRAM COMPLIANCE

TN&A. will strive for 100% compliance with safety and health regulations, utilize state-of-the art PPE, and comply with the most current occupational exposure limits.

Each person is responsible for his/her own safety and health, for completing tasks in a safe manner, and for reporting any unsafe acts or conditions to his/her supervisor and/or the SITE MANAGER/SSHO. All personnel are responsible for continuous adherence to established safety and health procedures during the performance of their work. All personnel are strongly encouraged to report unsafe conditions to their supervisor without fear of reprisal. The company empowers each individual with "stop work" authority when conditions are unsafe or may become unsafe due to other contributing factors. No person may work in a manner that conflicts with the letter or intent of safety and environmental precautions expressed in these applicable safety and health procedures. For violations of safety policy and procedures, TN&A will provide personnel with a verbal warning/reminder, formal documented verbal warning and then 2 written warnings. After due warnings, TN&A will dismiss from the work site any person who repeatedly or intentionally violates safety procedures. The severity of a violation may warrant immediate removal from a project.

Managers and supervisors will be held accountable for safety performance during the course of this project. Safety performance on projects will be reflected in performance appraisals, bonuses, and recognition programs, as deemed appropriate by senior management.

8.0 ACCIDENT REPORTING

It is the intent of the TN&A Accident and Crisis Management Program to ensure that each and every employee has a safe and healthful work environment and the knowledge to properly and safely perform his/her work. Besides company employees, the program covers all other workers (temporary, part-time and subcontractor) that TN&A controls, directs or supervises on the job, to the extent these workers are exposed to specific worksite and job assignment hazards. If air sampling and monitoring is required, the SITE MANAGER/SSHO will make sampling and monitoring results available to the site personnel. Results from personnel monitoring will be posted on the wall of the jobsite trailer and provided to effected personnel along with a letter from the CSHM explaining the results and any significance of the findings. The CS will track safe man hours worked on the project daily and document them in the Daily Production Reports.

Damage to vehicles and property other than ordinary wear, tear and operating breakage that involves TN&A employees, subcontractor employees and equipment constitutes an accident and shall be reported promptly to the employee's supervisor. Accident reports highlight problem areas so patterns can be detected and resources directed toward preventing a recurrence. Accident reports also make excellent training tools; the cause and effect of accidents can be reviewed at safety meetings. Accidents and injuries will be investigated immediately by supervisory personnel and results reported on a standard company form (see Appendix C). In the case of a 'near miss' accident or injury, a "Near Miss Occurrence Report" shall be completed. Copies of all completed forms should be forwarded to the Corporate Safety and Health Manager, the Project Manager and the ROICC. The SITE MANAGER/SSHO and/or the CS will prepare any required accident/incident reports with assistance from the persons directly involved.

In addition, if an accident meets any of the requirements of EM 385 01.D.02 (see specification section 01525 1.12.1 and 1.12.2), a Contractor Significant Incident Report (CSIR) will be submitted. **NOTE:** The CSIR will be obtained from the ROICC or the SHM. The CSIR will be submitted within four (4) hours of the accident.

Employees shall immediately report all injuries or illnesses sustained in the course of employment to their supervisor, foreman, or the TN&A Corporate Safety and Health Manager. If an employee goes to a medical facility under emergency conditions, the foreman will call the TN&A office and report the accident. When an employee goes to a medical facility, he/she will inform the medical facility that it is a Workers' Compensation case. The medical facility can verify this by calling the TN&A office. The medical facility will be told that all billing should be directed to the TN&A Corporate Safety and Health Manager. At no time will a private insurance card be given to a medical facility if the visit relates to a Worker's Compensation injury.

After being released from the medical facility, an injured employee will bring into the office (if possible) any medical instructions from the medical facility. If an employee is unable to return to the office and is instructed to go directly home, he/she must call the business office of the TN&A SSHO, at which point an accident report will be taken over the phone. If an employee is given "work restrictions" from a medical facility, he/she must report to the TN&A office prior to returning to work. Under no circumstances are employees with medical restrictions to report back to the field site prior to being released from the business office. All work restrictions will be discussed with the employee's supervisor and his/her doctor. If there are lost work days because of a Workers' Compensation case, the employee must obtain a "work release" from the doctor and a "return to work" slip and report to the business office. If there are any changes in the medical

status of a Workers' Compensation claim, the employee should report the change immediately to the business office.

8.1 RESPONSIBILITIES

In order to accomplish the objectives of this program, a team effort on the part of all TN&A employees, including subcontractors, is needed. It is essential that all personnel take an interest and participate actively in all phases of the Accident and Crisis Management Program. Everyone must accept responsibility for his/her own actions and conduct, follow safety and health procedures, and recognize and report hazards in his/her work area.

The responsibility for overseeing and maintaining the Accident and Crisis Management Program has been designated to the CSHM. The role of the CSHM is to provide corporate guidance and direction to facilitate the development and implementation of effective programs in the various TN&A Cost Centers. Each of the Cost Centers, with the assistance of the CSHM has the responsibility to develop any specific procedures and specialized applications that improve the effectiveness of the program.

9.0 MEDICAL SUPPORT

9.1 MEDICAL SURVEILLANCE AND FITNESS FOR DUTY

The purpose of the TN&A medical surveillance program is to provide uniform medical care, ensure the selection of employees physically able to safely perform the work assigned, monitor employee health on a regular basis, and provide medical care for occupational injury or illness. This program applies to all TN&A employees and subcontractors. Specific requirements of the program are described below.

9.1.1 Medical Evaluation

All personnel involved in on-site operations must participate in an ongoing medical surveillance program meeting the requirements of OSHA 29 CFR 1910.95, 1910.120 and 1910.134. The first examination will be conducted before personnel begin working at the Site. The medical surveillance protocols and examination results will be overseen by a licensed physician certified in Occupational Medicine by the American Board of Preventive Medicine or who, because of necessary training and experience, is Board-eligible. The baseline medical examination for the project will include the following:

- Complete medical and occupational work history,
- General physical examination,
- Complete blood count,
- Electrocardiogram,
- Urine analysis with microscopic examination,
- Pulmonary function test,
- Chest X-ray,
- Audiogram,
- Visual acuity measurement,
- Ability to wear respirator, and
- Stress test for employees over 40 years of age.

This requirement will be strictly enforced for TN&A personnel, as well as all subcontractor personnel. However, personnel currently participating in a medical surveillance program (with yearly medical examinations), which meets the requirements of 29 CFR 1910.120 relative to specific Site conditions, will not be required to have additional medical surveillance. Based on the results of this examination and other pertinent information, a medical certification as to the fitness for employment on this project, or any restrictions on that employee's ability to utilize PPE will be maintained at the Site. However, specific medical examination results will be maintained in strict confidence and will not be subject to disclosure without the explicit written approval of the employee. Beyond the general medical surveillance requirements listed above, no other chemical-specific requirements are applicable to TN&A employees based on historical data from previous projects and reasonable expectations of potential exposures at this Site. These requirements will be revised accordingly if data reveal that chemical-specific action levels are being exceeded.

9.2 ANNUAL EXAMINATION

Each TN&A employee who may be potentially exposed to hazardous chemicals, or who must wear a respirator for more than 30 days per year, and is exposed to occupational noise will receive an annual examination consistent with the baseline examination aforementioned.

9.3 EMPLOYEE NOTIFICATION OF MEDICAL EXAMINATION RESULTS

Dr. Jerry Berke, a licensed and experienced physician certified in Occupational Medicine by the American Board of Preventive Medicine, at Health Resources (a national medical surveillance program provider in Woburn, MA) will review the results of the medical evaluation. If the examination uncovers a serious health problem, the employee is contacted and also notified in writing by a case nurse at Health Resources. Health Resources also recommends that the employee see his/her family doctor. If the condition is more serious the case nurse from Health Resources will notify TN&A's health and safety manager. If the health condition is pertaining to the job, Health Resources will conduct follow-up monitoring.

9.4 LOST-TIME INJURIES/ILLNESSES

The occupational physician will evaluate any employee who loses time due to a workplace injury or illness during the period of the contract. The physician will complete appropriate forms and provide the supervisor with a copy, clearing the employee for return to work. Reports of all such accidents will be maintained at the site, and a copy of the ENG Form 3394 will be forwarded to the ROICC.

9.5 ON-SITE MEDICAL SUPPORT

In the event of serious personnel injury (fatality, patient unconscious, possibility of broken bones, severe bleeding, burns, blood loss, shock, or trauma), the first responder shall immediately:

- Administer first aid if qualified; if not qualified, immediately seek out a person qualified to administer first aid; **NOTE: the SITE MANAGER/SSHO and CS will be current 1st Aid and CPR Responders;** and
- Notify the Site Emergency Coordinator of the name of the victim, their location, and the nature of injury.

The Site Emergency Coordinator, upon receipt of notification of the injury, shall immediately:

- Notify emergency response and give the appropriate patient information and their location.
- Assist the injured party as deemed appropriate.
- Provide a copy of the injured party's medical data sheet to responding medical personnel.
- Designate someone to accompany the injured party to the hospital and to provide chemical data sheets to the emergency medical team.

- Notify the CM and SHM, if not already notified.
- Complete TN&A's Incident Report and Investigation Form.

If the Site Emergency Coordinator determines that emergency response is not necessary (minor injury such as sprain or abrasion, patient is conscious and can be moved), he/she may direct someone to transport the patient by vehicle to the hospital. A hospital route map will be located in all site vehicles. The Site Emergency Coordinator shall then fill out TN&A's Accident Report found in Appendix C.

In the event of an on-site injury requiring emergency medical care or emergency response, the following medical center will be used:

Community Hospital of Huntington Park

2623 E. Slauson

Huntington Park, CA

TN&A will be utilizing the Resident Physician(s) and/or On-Call Staff at Huntington Park Hospital for emergency situations. A map of the hospital and directions are included as Figure 2.

NOTE: When contacting the 911 emergency medical care service by cellular telephone inform the dispatcher that the call is originating from the Pemaco Superfund Project Site, the nearest intersection and unit number, and of the specific hazard (if known) to ensure that if the person is contaminated, emergency personnel at the hospital; will be prepared to receive the injured employee.

An occupational physician will evaluate any employee who loses time due to a workplace injury or illness during the period of the contract. The physician will complete appropriate forms and provide the CS with a copy and clear the employee for return to work as appropriate. Reports of all such accidents will be maintained at the site.

NON-Emergency Cases requiring a physician's care shall be referred to the following –

All non-emergency injury cases are referred to the following Urgent Care/Walk-In Clinic, located 1.84 miles from the site:

San Miguel Occupational Medicine and Urgent Care
1437 S Atlantic Blvd
Los Angeles, CA 90022
Telephone: 323-268-9900
Urgent Care/Walk-In Clinic

First Health Network
Managed Provider Network (MPN) with Wausau Insurance, TN&A Worker's Compensation Insurance Carrier.

10.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

The Corporate Safety and Health Manager will review all applicable work plans, site historical records, and remedial investigation results, etc. and evaluate each major work activity to determine the appropriate level of personal protective equipment needed for the work. This evaluation will include a consideration of: potential chemical, physical, and biological hazards present; work operations to be performed and associated hazards; potential routes of exposure; concentrations of contaminants present, and; characteristics, capabilities and limitations of PPE, and any hazards that the PPE may create or exacerbate (i.e. heat stress). Evaluation findings and recommendations will be listed in a PPE table that will include the date the evaluation was conducted, the activity evaluated, PPE recommendations, and name of person performing the assessment. The CSHM will complete this evaluation prior to the start of work and will conduct follow-up, jobsite inspections of PPE usage to verify the adequacy of PPE requirements. PPE changes may be made, as appropriate, depending on the results of these jobsite inspections.

The SSHO will also evaluate PPE usage at the jobsite on a daily basis and make recommendations to the CSHM for making equipment and/or work practice changes, if needed. At the concurrence of the CSHM, the PPE table and applicable AHA tables will be amended to reflect new or modified PPE requirements. All new or modified PPE requirements will be communicated to the site personnel during the daily site briefings and hazard communication training sessions.

Employees assigned to use PPE are required to inspect the equipment before and after each use, discard any equipment that is defective, clean and maintain the equipment according to manufacturer's recommendations, and store their PPE in a clean, secure area on-site each day. Specific PPE inspection, cleaning, and maintenance procedures vary according to the type of equipment being used. Employees will be informed of these equipment-specific use and maintenance procedures prior to being assigned to their jobs. Training in PPE selection, use, limitations, inspection, cleaning, and maintenance protocols will be provided during the site-specific orientation training conducted by the SSHO. Site-specific PPE training will be documented in the site activity logbook.

At a minimum, all site personnel will wear Level D PPE that will consist of the following items:

- Cotton coveralls, or long pants, short-sleeve shirt (minimum); leather gloves, hard hat, and safety glasses with side shields
- Leather work boots with steel toe
- Hearing protection as required
- ANSI Type III high intensity reflective safety vest while working in traffic or heavy equipment areas.

Level D is worn when the potential for direct chemical contact is minimal (such as when operating mobile equipment, mobilizing to the site, conducting normal O&M activities; etc.) and there is no inhalation or dermal contact hazard present. Other, more protective levels of protection, such as, Levels B and C incorporating respiratory protection and chemical protective clothing, may be required for certain workers depending on the nature of their work. The use of this equipment will

be specified in the applicable AHA table for a given work activity and in the PPE table mentioned above.

10.1 Limitations Of Personal Protective Equipment

Level D clothing will be worn only in areas where site contaminants do not pose a significant dermal contact hazard. Since Level D clothing is porous and, as such, does not provide liquid contact protection, this clothing will not be worn during activities involving the handling of wet materials or liquid chemicals.

Should the use of air purifying respirators be necessary, this equipment will only be worn if airborne concentrations are below IDLH levels and do not exceed maximum use concentrations of the cartridges or exceed maximum use limits of the facepiece seal (as per assigned protection factors). In addition, respirators will not be worn in unknown atmospheres, in oxygen deficient environments, or with contaminants that have poor warning properties. Air purifying respirators will not be worn for protection against carbon monoxide exposure. Only dilution ventilation will be used to address this exposure concern.

10.2 Personal Protective Equipment Inspection

Prior to donning protective clothing, each garment will be visually inspected to identify defects, such as, tears, cracks, holes, and delaminations, which may allow chemicals to penetrate the clothing. This inspection procedure will involve holding the clothing into the light to illuminate penetration points and stretching the fabric along stitched or bonded seams to confirm the structural integrity of the garment. The surface of the clothing will also be inspected for any signs of wearing, cracking, or degradation. Any openings or possible penetration points identified in this inspection process will be sealed and/or masked. Clothing that is contaminated or discolored will be discarded.

Other protective equipment, such as, safety glasses, chemical protective goggles, and face shields, will be inspected for structural integrity and cleanliness. Goggles and glasses that are severely scratched will be discarded. The face shields on full-face respirators (should they be needed) will be inspected in the same manner.

Respirators will be visually inspected before and after each use. This inspection procedure will look, most particularly, for any signs of wearing or warping of the facepiece seal and for defects in the valving system and attachment straps. All reusable respirators will be cleaned in soap and water solution after each use, dried, and placed in plastic bags for storage. Cartridges will be discarded no less often than once per week. All personnel using respiratory protection will be medically qualified to wear such equipment and will have received training in proper donning and doffing techniques, inspection procedures, respirator selection and limitations described herein. In addition, each respirator user will be qualitatively fit tested in the brand, type and size respirator they will be required to wear for the project. The donning, doffing, inspection, selection, and limitations training requirements mentioned above will also apply to all other types of protective equipment used by site employees. Employees issued respirators will be trained to conduct the positive and negative pressure seal test each time the respirator is donned to ensure a maximum effective seal and fit.

10.3 Monitoring Personal Protective Equipment Effectiveness

At the end of each shift, the SITE MANAGER/SSHO will examine the inside of a representative sample of chemical protective garments (Tyvek coveralls, gloves, and boots) before they are discarded or cleaned to identify evidence of chemical breakthrough. Such evidence would include any discoloration or staining of the clothing, thinning, blistering or cracking of the clothing material, and the presence of torn seams and perforations. The SSHO will also note if the workers themselves have become contaminated while wearing the PPE. If, based on this examination, it is apparent that the PPE designated for the work is not adequately controlling worker exposures, the level of personal protection will be upgraded at the direction of the CSHM.

Table 2. Personal Protective Equipment for Level D

TASK	HEAD	EYE/ FACE	FEET	HANDS	BODY	HEARING	RESP. PROTECTION
Changing of Bag Filters	HH	SG	STB	Nit/ LWG	TCM	EP/EM as need	FFAPR/POV
Changing of Particulate Filters	HH	SG	STB/ PVC/OB	Nit/ LWG	TCM	EP/EM as need	FFAPR/POV
Cutting/Repairing Conveyance Piping	HH	SG	STB	Nit/ LWG	Cot Cov	EP/EM as need	HMAPR/P100
Receiving Caustic Treatment Chemicals	HH	SG	STB/ PVC/OB	Nit	TCM	EP/EM as need	FFAPR/POV
Accessing Granular Activated Charcoal (GAC) Tanks	HH	SG	STB PVC/OB	Nit	TCM	EP/EM as need	FFAPR/POV
Control of Hazardous Energy (Lockout Tagout) Activities	HH	SG	PVC/OB	Nit	TCM	EP/EM as need	NA
Changing Elements on H202	HH	SG	STB	LWG	Cot Cov	EP/EM as need	NA
General Site Tasks General to all O&M Monitoring and Operating Parameters	HH	SG	STB/ PVC/OB	Nit/ LWG	Cot Cov	EP/EM as need	NA
Wellhead Monitoring	HH	SG	STB	LWG	Cot Cov	EP/EM as need	NA

HEAD PROTECTION	EYE/FACE PROTECTION	FOOT PROTECTION
HH=Hard Hat (ANSI Approved)	SG=Safety glasses with side shields (ANSI approved)	STB=Leather steel toe PVC/OB=Polyvinylchloride overboot LB = Latex Bootie Covers
HEARING PROTECTION	**HAND PROTECTION**	**BODY PROTECTION**
EP=Ear Plugs EM=Ear Muffs	LWG=Leather Work Glove PVC=Polyvinyl Chloride Nit=Nitrile inner gloves	Cot Cov=Cotton Coveralls PVC-RNG=PVC Raingear TCM=TyChem
RESPIRATORY PROTECT. FFAPR = fullface air purifying respirator; POV = Combo P100 filter w/ OV filter; HMAPR = halfmask APR; 95XQ=N95, R95 or P95 filter respirator (includes N99, R99, P99, N100, R100, P100 series)	When working with potential hazards a minimum of nitrile inner gloves will be used.	

* Based on air monitoring and/or air sampling results. During initial activities once it is determined that engineering controls are working, reducing the exposure levels based on real time monitoring of organic vapors. Respiratory Protection will not be used for level D.

11.0 PLANS (PROGRAMS AND PROCEDURES) REQUIRED BY THE SAFETY MANUAL (AS APPLICABLE)

11.1 LAYOUT PLANS (04.A.01)

NOT APPLICABLE - 04.A.01 Plans for the layout of temporary construction buildings, facilities, fencing, and access routes and anchoring systems for temporary structures shall be submitted to and approved by the GDA.

11.2 EMERGENCY RESPONSE PLANS

(1) Procedures and tests (01.E.01)

(2) Spill plans (01.E.01, 06.A.02)

(3) Firefighting plan (01.E.01, 19.A.04)

(4) Posting of emergency telephone numbers (01.E.05)

(5) Wild land fire prevention plan (09.K.01) Not Applicable

(6) Man overboard/abandon ship (19.A.04) Not Applicable

Fuels, lubricants, and hydraulic fluids will be used on-site to service mobile equipment. As a result, the possibility of a fuel spill or possibly a medical emergency (personnel injury, fire, or explosion) does exist. A copy of the Emergency Response Plan (this section) and the map to the Emergency Medical Facility will be posted at the work site by the SITE MANAGER/SSHO and kept in all TN&A project vehicles.

The Emergency Response Plan shall be rehearsed once every four weeks throughout the duration of the project. The rehearsal shall include a staged personnel injury or fuel spill mishap. At the completion of the emergency response exercise, the CM and SITE MANAGER/SSHO will evaluate the effectiveness of the emergency response procedures and modify the SHSP as appropriate.

A listing of emergency response contacts for this project is presented in following phone list.

PEMACO SUPERFUND SITE PHONE LIST (updated 8-8-07)
5973 S. District Blvd.
Maywood, CA 93001
Phone: 323-771-0414
Fax: 323-771-0014

Name	Job Title	Telephone	Cell Phone	Fax	Email
T N & Associates Ventura Office		**(805) 585-2110**		**(805) 585-2111**	
Tim Garvey	Program Manager/ QC Manager	(805) 585-6386	(805) 290-7320		tgarvey@tnainc.com
Dacre Bush	Project Manager	(805) 295-9071			dbush@tnainc.com
John Wingate	Project Engineer	(805) 585-6389	(805) 797-0340		jwingate@tnainc.com
Jacques Marcillac	Project Geologist	(805) 5856382	(805) 797-0021		jmarcillac@tnainc.com
Danny Chen	Staff Engineer	(805) 585-6395	(626) 315-2145		dchen@tnainc.com
Ewelina Mutkowska	Project Chemist	(805) 585-6390			emutkowska@tnainc.com
Terry Baker	Database Manager	(805) 585-6395			tbaker@tnainc.com
Tim Tierney	Web Site Manager	(805) 585-6384			ttierney@tnains.com
PLC & SCADA					
Mike Ebner	PLC Programmer	(715) 834-5201	(715) 864-5209		mebner@aspecteng.com
O&M					
Mark Prostko	O&M Manager/Site Superintendent	(323) 771-0414	(856) 491-6950	(323) 771-0014	mprostko@tnainc.com
Edwin Moncayo	Lead O&M Tech.		(562)-577-4890		edwin.moncayo@earthtech.com
Hector Cervantes	O&M Tech.		(323) 547-8110		cervantes_chetos@hotmail.com
USACE					
John Hartley	Project Manager	(626) 401-4094	(402) 216-4248		John.R.Hartley@usace.army.mil
Rick Lainhart	Construction Oversight	(805) 482-6088	(951) 316-0430	(626) 401-4007	richard.s.lainhart@usace.army.mil
US EPA					
Rose Marie Caraway	Remedial Project Manager	(415) 972-3158	(707) 208-0732	(415) 947-3526	Caraway.RoseMarie@epamail.epa.gov

Table 3. Additional Emergency Response Contacts

Police, Fire, and Ambulance	**911**
Community Hospital Of Huntington Park 2623 East Slausen Avenue Huntington Park, CA 90255	(323) 583-1931
San Miguel Occupational Medicine And Urgent Care 1437 S Atlantic Blvd Los Angeles, CA 90022	(323) 268-9900
National Response Center (Chemical and Oil Spills)	**(800) 424-8802**
Poison Information Center Los Angeles County	**(800) 825-2722**
TN&A Corporate Safety and Health Manager (William Fink)	**Office: (414) 607-6779** **Cell: (414) 234-7845**

If you have an incident which involves:

Spill	Non-TN&A personnel
Release	Coverage or publicity
Fire	Possible insurance company action
Explosion	Damage to TN&A property
Personal injury (more than first aid)	Regulatory agency notice of violation
Highway accident	

IMMEDIATELY CONTACT one of the following personnel starting at the top of the list:

Name	Work Tel. No.	Mobile No.
Tim Garvey	(805) 585-6386	(805) 290-7320
Dacre Bush	(805) 295-9071	(805) 295-9071
John Wingate	(805) 585-6389	(805) 797-0340
Mark Prostko	(323) 771-0414	(856) 491-6950

If the incident is reportable to outside regulatory agencies, notify the individuals listed in items #1 or #2 in the table above.

The primary client contact is:
John Hartley, Project Manager, USACE
Tel: (626) 401-4094 and 402 293 2523
Cell: (402) 216-4248

The alternate client contact is:
Rose Marie Caraway, Remedial Project Manager, USEPA
Tel: (415) 972-3158
Cell: (707) 208-0732

11.2.1 Site Emergency Coordinator

TN&A has assigned responsibility for implementation of this Emergency Response Plan to the Site Manager who will be the designated Site Emergency Coordinator. The Site Emergency Coordinator will be responsible for ensuring the evacuation, emergency treatment, emergency transport of site personnel as necessary, and notification of emergency response units and appropriate TN&A management staff. In addition to the APP, the detailed project Emergency Response Plan (ERP) must be reviewed and referenced for situations as they may apply to the project.

The Site Emergency Coordinator shall conduct an inspection of emergency response equipment on a monthly basis. This equipment includes fire extinguishers, first aid kits, and spill control equipment. As part of the daily site walk-through, he/she shall pay close attention to potential fire hazards, spill potentials, and individual work practices. The emergency response equipment will be stored in a locker placed in the general work area at each demolition site. Monthly fire extinguisher checks shall be documented, either on the fire extinguisher or in the SITE MANAGER/SSHO logbook.

An air horn will be used to alert site personnel in the event of an emergency. One air horn will be located in each of the exclusion zone work areas, in each first aid kit, and in the office. The SITE MANAGER/SSHO will test the effectiveness of the air horn during initial site activities and at least monthly thereafter, to ensure that all site personnel can clearly perceive the alarm above operational noise levels. If operational noise levels prevent site personnel from detecting the air horn alarm, other means of notification will be implemented.

In the event of an emergency situation, such as a fire, explosion, etc., the Site Emergency Coordinator shall immediately:

- Establish the safety of all personnel, direct the administration of first aid as appropriate;
- Shut down all combustion equipment;
- Notify local Maywood Fire Dept. emergency response dispatch and give the exact location of the evacuated area;
- Prohibit outside personnel from entering the evacuated area until the Maywood Fire Department arrives;
- Provide emergency equipment as appropriate; and
- Notify the PM and SHM, if not already notified.

One long blast on the air horn will be the signal to evacuate the site immediately. The initial assembly point for site personnel will be the construction trailer. Once the evacuation signal has been sounded and site personnel have assembled at the assigned staging area, a head count will be taken.

The primary assembly area will be the field trailer and the secondary assembly area will be the street outside the main gate.

After everyone is accounted for, they will evacuate further to a safe area designated during the daily tailgate safety briefing and the Site Emergency Coordinator will assess the situation and outline the actions to be taken. Two short blasts will be the "all clear" signal, indicating that personnel can once again re-enter the site and resume work.

Communication of evacuation routes and assembly points shall occur daily during the tailgate safety briefing. Communication of hospital routes and emergency telephone numbers will be through the posting of this information in the site office and throughout the building.

11.2.2 Spill Plan

In the event of a spill of hazardous materials (such as gasoline or diesel fuel), the Site Emergency Coordinator or his designee shall control the spill and proceed to absorb or containerize the material. In addition, the Site Emergency Coordinator may, at his/her discretion, direct the SITE MANAGER/SSHO to conduct air monitoring to further characterize the nature and extent of the incident.

A small spill - less than 5 gallons - shall be handled by TN&A personnel. For spills greater than 5 gallons, TN&A shall inform the Hazardous Material (HAZMAT) response team. TN&A personnel will respond as necessary until the HAZMAT team arrives.

The Environmental Response Plan (ERP), Section 3.1 – TN&A Spill Response Plan will be followed. The ERP spells out in details response protocol and therefore details will not be repeated herein.

The aforementioned spill procedures apply to spills occurring on land or within the confines of the construction area. Any spills that occur in the water, including releases to the storm drains that discharge to the LA River, will be reported to the appropriate regulatory authorities (i.e. Coast Guard, EPA, etc.) They will direct on-site cleanup resources and efforts. Stormwater runoff protection is addressed in the ERP.

In the event of an explosion, all non-essential personnel shall evacuate and help secure the site. It is essential that the site be evacuated and no one allowed to re-enter, except to possibly save a life, until cleared by the Emergency Coordinator. The Emergency Response Team will determine what actions, if any, are appropriate.

11.2.3 Firefighter Plan

Prevention - The primary goals of fire prevention and protection measures are:

- To control ignition sources, and
- Early detection and rapid response.

The following guidelines will be followed at the Site to achieve these goals:

- Smoking will be prohibited on-site except in designated areas approved by the SSHO. No welding, open flame, or spark-producing operations will be allowed on-site unless evaluated and approved by the SITE MANAGER/SSHO. A TN&A Hot Work Permit issued by the SSHO will be required for all hot work.
- Recognition - All fires and visible smoke will be reported at once to the Site Supervisor who will report to the Project Manager.
- Response - In the event of fire or explosion, Site evacuation procedures will be implemented and emergency response services will be notified.
- TN&A personnel will only attempt to extinguish small incipient fires (e.g., fires that can be extinguished with available portable fire extinguishers). In the event of larger fires, TN&A will notify the proper authorities and evacuate the site in accordance with the Emergency Response and Contingency Plan.

Only approved (by a nationally recognized testing laboratory) containers and portable tanks shall be used for the storage of flammable and combustible liquids. Metal containers and portable tanks (less than 660 gallons individual capacity) shall meet the requirements of Chapter I, Title 49 of the Code of Federal Regulations (U.S. DOT Hazardous Materials Regulations), Chapter 9 of the United Nations Rules for Transportation of Dangerous Goods, or NFPA 386, Standard for Portable Shipping Tanks for Flammable and Combustible Liquids. Plastic fuel containers shall

meet one or more of the following specifications: ANSI/ASTM D3435, Plastic Containers (Jerry Cans) for Petroleum Products; ASTM F 852, Standard for Portable Gasoline Containers for Consumer Use; ASTM F 976, Standard for Portable Kerosene Containers for Commercial Use; ANSI/UL 1313, Nonmetallic Safety Cans for Petroleum Products. All small containers of flammable liquid shall be stored in an approved flammable liquid storage cabinet when not in use.

11.3 EMERGENCY EQUIPMENT

TN&A will supply and maintain all protective clothing and emergency equipment necessary for our crews. Basic emergency and first aid equipment is as follows for each activity as determined by the SITE MANAGER/SSHO:

- First aid kits with biohazard kit for 10 people
- One 2A-10 B: C type, dry chemical fire extinguisher
- Air horn
- Emergency 15-minute, ANSI approved eye wash
- Spill equipment as mentioned in Section 12.2,
- Poly-Tyvek clothing, nitrile gloves, PVC boots, hard hats, safety glasses
- Cellular phones and/or radios.

The above units will be setup each day in close proximity to work activities. These will be shown on the site map and discussed in the initial site orientation.

At least two persons certified in first aid/CPR will be on-site at all times during demolition activities. The SITE MANAGER/SSHO and CS also will be certified in first aid/CPR. The SITE MANAGER/SSHO will provide on-site personnel with first-aid procedures including heat stress, cold stress, shock, accident prevention, heart attack, and stroke.

Postings related to the Emergency Response Plan will be placed in the support zone and crew vehicles. The following information from the Emergency Response Plan shall be highlighted on these postings:

- Emergency telephone numbers for fire, ambulance, hospitals, police
- Name and telephone number of the SHM, PM, and SITE MANAGER/SSHO
- Location of fire extinguishers and emergency equipment
- Map to the hospital.

11.4 HAZARD COMMUNICATION PROGRAM (01.B.06)

Provide the location of MSDS, records of Contractor employee training, and inventory of hazardous materials (including approximate quantities and a site map) that will be brought onto Government project by the Contractor and subcontractor.

To comply with 29 CFR 1910.1200, Hazard Communication, the following excerpt from the TN&A's written Hazard Communication Program is incorporated into this APP.

All employees will be briefed on this program and have a written copy for review.

All containers of all chemical products used on-site will be:

(1) Marked as to its contents

(2) Labeled with hazard chemical warnings and

(3) Labeled with the name and address of the manufacturer.

(4) All secondary containers will be labeled with either an extra copy of the original manufacturer's label or with generic labels that have a block for identification and blocks for the hazard warning.

Copies of MSDS for all hazardous chemicals brought onto the site, such as, decontamination chemicals, gasoline and other fuels, equipment calibration gases, etc. will be maintained in the work area. MSDS will be available to all employees for review during each work shift. In addition to MSDS, the Hazardous Material Inventory Form (Appendix C) will be used to inventory hazardous materials and will be made available to all employees.

Prior to starting work, each employee will attend a health and safety orientation and will receive information and training on the following:

- An overview of the requirements contained in the Hazard Communication Standard, 29 CFR 1910.1200
- Chemicals present in their workplace operations
- Location and availability of a written hazard program
- Physical and health effects of the hazardous chemicals
- Methods and observation techniques used to determine the presence or release of hazardous chemicals
- How to lessen or prevent exposure to these hazardous chemicals through usage of control/work practices and personal protective equipment
- Emergency procedures to follow if they are exposed to these chemicals
- How to read labels and review MSDS to obtain appropriate hazard information
- Location of MSDS file and hazardous chemical list

The SSHO will prepare an inventory of hazardous materials maintained on-site; an example of this inventory form is presented in Appendix C – Accident Prevention Program Forms.

11.5 RESPIRATORY PROTECTION PLAN (05.E.03)

The following excerpt from the TN&A Corporate Safety and Health Manual Respiratory Protection Program describes the Purpose, Scope and Guidelines of the program. In addition, the SITE MANAGER/SSHO will be the on-site Program Administrator of the program.

Purpose

To provide respiratory protection to employees who have exposures to hazardous conditions. TN & Associates, Inc. (TN&A) has developed this program to aid in the control of possible occupational diseases and injuries that may be linked to breathing potentially contaminated air in the workplace. The air may have harmful concentrations of dust, fog, fumes, mists, gases, smoke, sprays, or vapors. This program is also intended to satisfy the OSHA requirements pertaining to respiratory protection found in 29 CFR 1910.134, as revised January 8, 1998.

Scope

All TN&A locations.

Guidelines

It is the policy of TN&A to prevent or reduce atmospheric contamination by using acceptable engineering controls. However, when this is not technically feasible or practical, or while such controls are being instituted, appropriate respirators shall be used when necessary to protect the health of our employees.

Field sites should use this program to develop effective site-specific respiratory protection programs that fit the needs of each site wherever respirators, including disposable dust masks, are required or voluntarily used by employees. A complete site-specific program that addresses all of the sections contained in this manual must be developed for all sites where employees are required to utilize respiratory protection.

A copy of the TN&A Respiratory Protection Program will be on-site with the Corporate Safety and Health Program documents

11.6 HEALTH HAZARD CONTROL PROGRAM (06.A.02)

11.6.1 Heat Stress

When the body temperature rises, the body seeks to dissipate the excess heat. The major disorders due to heat stress are heat cramps, heat exhaustion, and heat stroke. The symptoms and recommended prevention for each are listed below:

- Heat cramps are painful spasms that may occur in the muscles of workers who have perspired profusely in the heat. If this occurs work should be stopped and the worker supplied with fluids.

- Heat exhaustion is characterized by extreme weakness or fatigue, dizziness, nausea, and headache. In serious cases, a worker may vomit or lose consciousness. The skin is clammy and moist, complexion pale or flushed, and the body temperature can be normal or slightly higher than normal. Treatment consists of rest in a cool place and replacement of body fluids lost through perspiration. Mild cases may recover spontaneously with this treatment. Severe cases may require care for several days. There are no permanent effects.

- Heat stroke is caused by the breakdown of the body's heat regulating mechanism. The skin is very dry and hot with a red or bluish appearance. Unconsciousness, mental confusion, or convulsions may occur. Without quick and adequate treatment, the result can be permanent brain damage or death. Medical assistance should be given quickly. The person should be moved to a cool place. Soaking the person's clothes with water should reduce body heat through evaporative cooling and application of ice especially to underarms and groin area and possibly to head will aid to facilitate rapid reduction in core temperature.

    - Concerns with heat stress generally can be expected whenever temperatures exceed 80° F. Therefore, the following requirements should be initiated and adhered to when ambient temperature exceeds 80° F.

- Acclimate the body to the working environment.

- Drink cool water to replace body fluids lost during sweating. Site personnel taking prescribed heart and/or high blood pressure medication may require electrolyte-replenishing liquids to combat heat stress. It is recommended that each individual taking prescribed heart and/or high blood pressure medication consult his personal physician prior to consuming these drinks.

- Wear personal cooling devices only in extreme cases.

- Wear supplied air suits or respirators equipped with a vortex tube that cools the air being supplied.

- Take rest breaks as frequently as necessary to prevent personal distress and development of symptoms.

- Count pulse rate during a 30-second period as early as possible in the rest break. If heart rate exceeds 110 beats per minute at the beginning of the rest break, shorten the next work cycle by one-third and keep the rest break the same. If the heart rate still exceeds 110 beats per minute at the next rest break, shorten the following work cycle by one-third.

- The use of the wet bulb globe temperature (WBGT) measurement method to determine safe work/break cycle regimens will be employed.

Refer to Appendix B for additional information on Heat Stress Hazards and Screening Criteria for Heat Stress Exposure (WBGT Values in °C).

11.6.2 Chemical Contaminants

Trichloroethylene (TCE)

Exposure Routes: inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms: Irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen]

Target Organs: Eyes, skin, respiratory system, heart, liver, kidneys, central nervous system

Cancer Site: [in animals: liver & kidney cancer]

11.7 METAL FUMES - GENERAL WELDING, CUTTING, AND HEATING

Welding, cutting, or heating not involving conditions or toxic materials may normally be done without mechanical ventilation or respiratory protective equipment. These protections shall be provided, however, where an unsafe accumulation of contaminants exists because of unusual physical or atmospheric conditions.

Employees performing any type of welding, cutting, or heating shall be protected by suitable eye protective equipment in accordance with the requirements of Subpart E—Personal Protective and Lifesaving Equipment.

11.7.1 Welding, Cutting, and Heating in Way of Preservative Coatings—1926.354

Before welding, cutting, or heating is commenced on any surface covered by a preservative coating whose flammability is not known, a test shall be made by a competent person to determine its flammability. Preservative coatings shall be considered to be highly flammable when scrapings burn with extreme rapidity.

When coatings are determined to by highly flammable, they shall be stripped from the area to be heated to prevent ignition.

Protection against toxic preservative coatings:

In enclosed spaces, all surfaces covered with toxic preservatives shall be stripped of all toxic coatings for a distance of at least four inches from the area of heat application, or the employees shall be protected by air line respirators meeting the requirements of Subpart E—Personal Protective and Lifesaving Equipment.

In the open air, employees shall be protected by a respirator, in accordance with the requirements of Subpart E—Personal Protective and Lifesaving Equipment.

The preservative coatings shall be removed a sufficient distance from the area to be heated to ensure that the temperature of the unstripped metal will not be appreciably raised. Artificial cooling of the metal surrounding the heating area may be used to limit the size of the area required to be cleaned.

11.7.2 Welding Health Hazards - Chemical Agents

Zinc

Zinc is used in large quantities in the manufacture of brass, galvanized metals, and various other alloys. Inhalation of zinc oxide fumes can occur when welding or cutting on zinc-coated metals. Exposure to these fumes is known to cause metal fume fever. Symptoms of metal fume fever are very similar to those of common influenza. They include fever (rarely exceeding 1025 F), chills, nausea, dryness of the throat, cough, fatigue, and general weakness and aching of the head and body. The victim may sweat profusely for a few hours, after which the body temperature begins to return to normal. The symptoms of metal fume fever have rarely, if ever, lasted beyond 24 hours.

Iron Oxide

Iron is the principal alloying element in steel manufacture. During the welding process, iron oxide fumes arise from both the base metal and the electrode. The primary acute effect of this exposure is irritation of nasal passages, throat, and lungs. Although long-term exposure to iron oxide fumes may result in iron pigmentation of the lungs, most authorities agree that these iron deposits are not dangerous.

Fluorides

Fluoride compounds are found in the coatings of several types of fluxes used in welding. Exposure to these fluxes may irritate the eyes, nose, and throat. Repeated exposure to high concentrations of fluorides in air over a long period may cause pulmonary edema (fluid in the lungs) and bone damage. Exposure to fluoride dusts and fumes has also produced skin rashes.

11.8 Lead Abatement Plan (06.B.05 & Specifications)

Not applicable

11.9 Asbestos Abatement Plan (06.B.05 & Specifications)

Not applicable

11.10 Abrasive Blasting (06.H.01)

Not applicable

11.11 Confined Space (06.I)

Full entry into the O&M system process tanks will not be conducted by site technicians. Permit entry conditions will be established for process tank entries. Non-permit entry protocols will be established for trenching and excavation activities conducted outside of the treatment building. Atmospheres within these vessels must be tested for oxygen deficiency (<19.5% O2), flammability (>10%LEL), and toxicity (>PEL) prior to entry. Appendix G contains the Confined Space Entry Program for the Treatment Facility Operations.

11.12 HAZARDOUS ENERGY CONTROL PLAN (12.A.07)

11.12.1 Electrical and Utility Hazards

Electrical hazards exist from the use of electrical equipment at the site. All electrical equipment will be visually inspected for external defects to the equipment, including the cord. Should there be any evidence of damage; the equipment is not to be used.

All electrical equipment must use a ground fault circuit interrupter (GFCI) system. Electrical equipment must be stored in a dry area and must not be used outside in the rain.

These guidelines are "performance based" in that each organization should devise and implement its own program in order to meet its own needs and address each of the requirements contained herein. These guidelines contain the most current information available. The OSHA standard, "Control of Hazardous Energy," (more commonly referred to as Lockout/Tagout) is found in 29 CFR 1910.147.

Lockout/tagout is intended to specifically cover the servicing and maintenance of machines and equipment in which the unexpected energizing, startup, or release of stored energy could cause injury to employees. It establishes requirements for the lockout/tagout of energy isolating devices whenever maintenance or servicing is done. An energy source can include electrical, mechanical, hydraulic, pneumatic, chemical, or thermal. An "energy-isolating device" is a mechanical device that physically prevents the transmission or release of energy. There are many kinds, but the control circuit types of devices (such as push buttons and selector switches) are not energy isolating devices. An energy-isolating device must positively stop the transmission or release of energy. An energy-isolating device is capable of being locked out when it has a lock built into it, or it can be physically locked (the lock itself can use a key or combination).

Put another way, lockout/tagout ensures that the machine or equipment is stopped, isolated from all potentially hazardous energy sources, and locked out before employees perform any servicing or maintenance where the unexpected start-up or release of stored energy could cause injury.

Details for applying lockout/tagout to the Pemaco system are presented in the Operations and Maintenance manual for the treatment system.

11.12.2 Lockout/Tagout Exceptions

There are four exceptions to when lockout/tagout devices do not have to be used:

1. If you can unplug the cord for the machine or equipment, and doing so eliminates the only possible hazard, then you do not need to use lockout/tagout. The plug must be under the exclusive control of the employee performing the work.

2. Normal production operations such as minor tool changes, adjustments, and minor servicing are not covered with the following conditions:
   - If they are routine, repetitive, and integral to the use of the machine for production.
   - And, the work is performed using alternative measures (to lockout/tagout), which provide effective protection.
   - But, if an employee must remove or bypass guards or other safety devices, or place his/her body in the "point of operation," then lockout/tagout must be followed.

3. If a machine or equipment meets all eight of these elements:
    - The machine or equipment has no potential for stored energy (residual or re-accumulated) after shutdown that could cause injury to employees.
    - It has a single energy source that can be readily identified and isolated.
    - Isolating and locking out that energy source will completely de-energize and deactivate it.
    - It is isolated from that energy source and locked out.
    - A single lockout device will achieve a locked out condition.
    - The lockout device is under the exclusive control of the authorized employee performing the work.
    - The work does not create a hazard for other employees.
    - In using this exception, there is no potential for unexpected activation or re-energizing.

4. Hot tap operations on pressurized pipelines (gas, steam, water, petroleum, etc.) do not apply to the facility operations. and therefore, these procedures aren't detailed in this plan.

11.12.3 Energy Control Program

The Energy Control program consists of three basic areas. There need not be an overall written program, but these three basic areas each have written requirements:

There must be written procedures for lockout/tagout of each machine or piece of equipment. Similar machines may be grouped. Specific exceptions are listed in the Corporate Health and Safety Manual; there must be written, periodic inspection records; and there must be written training records.

If the energy-isolating device can physically be locked out, it should be. Tags should be used only if it cannot be locked out. There are strict conditions for using a tagout. Whenever new machinery or equipment is installed, a requirement is that the energy-isolating device must be designed to accept a lockout device. For the purposes of lockout/tagout, these definitions will apply:

- An "authorized employee" is one who is required to perform the lockout/tagout in accordance with this procedure and actually does the servicing or repair;
- An "affected employee" is one who is not doing the locking out but one who is required to work at the machine or be in the area; and
- "Other employees" are those who may be in an area where lockout/tagout is used.

11.12.4 Lockout/Tagout Procedure

There must be a written procedure for each machine or piece of equipment that requires servicing or maintenance. Similar machines and equipment (such as those using the same type and magnitude of energy and have the same or similar types of controls) can be covered with a single written procedure. Air valves, when used, as energy isolating devices, must be lockable and self-bleeding. If it is not obvious what they operate, they must be labeled. If they are not self-bleeding, the bleed-off valve must be locked open.

The written procedure should contain a specific statement of the intended use of the procedure, the name of the machine or equipment the procedure is intended for (similar machines may be grouped), and the location, department, etc., of the machine or equipment. It should also contain a chart or similar arrangement showing each type and magnitude of energy utilized and each energy isolating device required, the location on the machine or equipment of each energy isolating device, and the method to be used, either lockout or tagout, on the energy isolating device.

The authorized employee will need to have a lockout/tagout device for each energy-isolating device. Note: Each and every energy source that could cause the unexpected energizing, start-up, or release of stored energy must have an energy-isolating device.

Next, each of the following points should be covered in the written procedure for the sequence of lockout/tagout:

The authorized employee should notify all affected employees that service or maintenance is required and that the machine or equipment will be shut down and locked out/tagged out. If the machine or equipment is operating, shut it down by the normal stopping procedure. Use the list of energy isolating devices to isolate the machine or equipment from all energy sources. Lockout/tagout the energy isolating devices to the safe or off position.

Stored or residual energy must be dissipated, restrained, relieved, disconnected, and rendered safe by methods such as grounding, repositioning, or blocking, bleeding down, etc. Stored or residual energy can be in such forms as capacitors, springs, elevated machine members, rotating flywheel, hydraulic systems, and air, gas, steam, or waste pressure. If stored energy can re-accumulate to a hazardous level, it must continuously be verified that it has not done so.

Test to make certain the equipment will not operate. First, check that no personnel are exposed. Operate the controls to make certain the equipment will not operate. Return the controls to the off/neutral position after the test.

Finally, the following points should be covered in the written procedure for the return of the machine or equipment to operation or service:

Check the area around the machine to ensure nonessential items have been removed and machine components are operationally intact, guards replaced, etc.;

- Check the area to make sure all employees are safely removed;
- Verify that the controls are in off or neutral; and
- Notify affected employees that service or maintenance is complete, and the machine or equipment is ready for use.

If the lockout/tagout must be removed during the maintenance for servicing, testing, or positioning of the equipment, then a section of the procedure must discuss how to do this (refer to the Corporate Health and Safety Manual). If group lockout/tagout is required, then a section of the procedure must discuss how to do this.

11.12.5 Periodic Inspection

Each lockout/tagout procedure for a particular machine (or group of machines) must be reviewed at least annually to correct any inadequacies and make sure it is being followed. After review (with or without corrections) annual training must take place. This must be done by an authorized employee who does not use that particular procedure.

A procedure that uses only lockout must be reviewed with all authorized employees. A procedure that uses tagout in any part of it must be reviewed with all authorized and affected employees. The inspection must provide for and ensure effective correction of identified deficiencies. There must be a written inspection certification sheet, which lists:

- The name of the procedure for the machine/equipment, and the location/department being inspected;
- Date of the inspection;
- Employees included in the inspection;
- Inspector's name;
- The deficiencies found in the procedure; and
- The corrective action taken (procedure rewritten) and date completed; retraining must take place now.

11.12.6 Training and Communication

Authorized employees must be trained in the recognition of hazardous energy sources, the type and magnitude of energy available in the workplace, and the methods and means of energy isolation and control. Affected employees must be trained in the purpose and use of energy control procedures. Other employees must be instructed as to the procedures and the prohibition against tampering with lockout/tagout devices. If it is locked out or tagged out, they should not attempt to start, energize, or use the machine or equipment.

There must be a written record (certification) of training or retraining to include the employee's name and date of training. Retraining is necessary annually during the certification and whenever these changes occur:

- Employee job change;
- New hazard because of change in machine or equipment;
- Change in energy control procedure; and/or
- Periodic inspection reveals inadequacies.

When the energy-isolating device is not lockable, tagout may be used. It is preferable to lock out the energy-isolating device. If tagout is used, there must be additional training and more rigorous periodic inspections. When tagout systems are used, employees shall also be trained in the following limitations of tags:

Tags are essentially warning devices affixed to energy isolating devices and do not provide the physical restraint on those devices that is provided by a lock. When a tag is attached to an energy isolating means, it is not to be removed without authorization of the designated person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated.

To be effective, tags must be legible and understandable by all authorized employees, affected employees, and all other employees whose work operations are or may be in the area. Tags and their means of attachment must be made of materials that will withstand the environmental conditions encountered in the workplace. Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program. Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.

Where tagout is used for energy control, the periodic inspection shall include a review, between the inspector and each authorized and affected employee, of that employee's responsibilities under the energy control procedure being inspected.

11.12.7 Material and Hardware

All protective material (locks, chains, tags, wedges, key blocks, etc.) shall be provided by TN&A. The locks and tags must have the individual name of the employee on them and be for their exclusive use. These devices can only be used for lockout/tagout procedures and not for any other purpose.

The locks must be durable and able to withstand their environment for their maximum time of exposure. The locks must be substantial so that they cannot be removed without special tools or force. The identification tags must be attached with the equivalent of a single use (50 lb.) self-locking nylon cable tie. They must warn, in writing, of the hazardous condition and must clearly indicate that movement from safe or off position is prohibited. The lockouts and tagouts must be standardized for each specific field site.

11.12.8 Employee Unavailable to Remove Lockout/Tagout

If the employee who placed the lockout/tagout device is not present to remove it, TN&A may remove it by verifying the employee is not present, removing the lockout/tagout after assuring it is safe to do so, and making a reasonable effort to contact the employee and tell him the device is removed. The sequence for temporarily removing lockout/tagout for test or positioning is as follows:

- Clear the machine or equipment;
- Remove employees from the area;
- Remove lockout/tagout devices;
- Energize and proceed with testing or positioning; and
- De-energize and reapply lockout/tagout devices.

11.12.9 Outside Contractors

Lockout/tagout procedures must be coordinated between the General Contractor and site personnel to ensure protection.

11.12.10 Group Lockout/Tagout

The group lockout must have the same level of protection as a personal lockout/tagout device. One person can be in charge of the group procedure, but each individual employee must attach his or her own personal lockout/tagout device by means of a group device. Special care must be taken during shift changes to ensure continuity of coverage of lockout/tagout protection.

11.13 CRITICAL LIFT PROCEDURES (16.C.18)

The definition of a **"critical lift"** per the EM 385-1-1 (3 Nov 2003) is as follows:

> **Critical lift**: a non-routine crane lift requiring detail planning and additional or unusual safety precautions. Critical lifts include lifts made when the load weight is 75% of the rated capacity of the crane; lifts that require the load will be lifted, swung, or placed out of the operator's view of lifts made with more than one crane; lifts using more than one hoist; lifts involving non-routine or technically difficult rigging arrangement; hoisting personnel with a crane or derrick; lifts involving hazardous materials (e.g., explosives, highly volatile substances); lifts involving submerged loads; lifts without the use of outriggers using on-rubber tire load charts; lifts where the center of gravity could change; or any lift that the lift or crane operator believes should be considered critical.

A **"Critical Lift Plan"** is required under Section 16.C.18.

> SECTION 16 - MACHINERY AND MECHANIZED EQUIPMENT; 16.C CRANES AND DERRICKS – GENERAL; 16.C.18 Critical lift plans.
>
> Before making a critical lift, a qualified person shall prepare a critical lift plan. (The qualified person preparing the plan may be the crane operator, lift supervisor, or the rigger). The crane operator, lift supervisor, and rigger shall participate in the preparation. The plan shall be documented and a copy shall be provided to the GDA. The plan shall be reviewed and signed by all personnel involved with the lift.
>
> a. The plan shall specify the exact size and weight of the load to be lifted and all crane and rigging components that add to the weight. The manufacturer's maximum load limits for the entire range of the lift, as listed in the load charts, shall also be specified.
>
> b. The plan shall specify the lift geometry and procedures, including the crane position, height of the lift, the load radius, and the boom length and angle, for the entire range of the lift.
>
> c. The plan shall designate the crane operator, lift supervisor and rigger and state their qualifications.

d. The plan will include a rigging plan that shows the lift points and describes rigging procedures and hardware requirements.

Anticipated lifts include, but are not limited to, moving the TRS PCU in and out of the treatment building and delivery of switchgear. Prior to the mobilization of mobile cranes, the SITE MANAGER/SSHO and the SHM will prepare **"critical lift plans"** for the designated lifts. These plans will be prepared in accordance with Section 16.C.18 above and have full involvement of the crane operator, the lift supervisor and the rigger.

11.14 CONTINGENCY PLAN FOR SEVERE WEATHER (19.A.03)

In the event of adverse weather, the SITE MANAGER/SSHO working with the Site Superintendent will determine if work can continue without jeopardizing the health and safety of field workers. Some of the items to be considered prior to determining if work should continue are:

- Extreme heat and wind,
- Heavy precipitation,
- Limited visibility, and
- Potential for accidents.

Refer to Table 4.

Table 4. Severe Weather Plan

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
Severe Weather Alert	Severe Weather • Thunderstorm • Heavy Rain • High Winds/Tornado • Earthquake	Monitor local weather through available media or a weather radio. During daily safety meetings, address inclement weather procedures: Lightning and/or Thunder: Equipment shutdown Proceed to support zone Await further instruction from Project Manager or SSHO Heavy Rain/Wind: If visibility is affected, shut down equipment Proceed to support zone Await further instructions from the SSHO High Winds/Tornado: Equipment shut down Shelter in Place in the treatment building control room. Await further instructions from the SSHO

Principal Steps	Potential Safety/Health Hazards	Recommended Controls
		Earthquake Shelter in Place Following event - Equipment shut down and Proceed to support zone Await further instructions from the SSHO **NOTE: A 30-minute STAND DOWN period is required after encountering Lightning, Thunder, Heavy Rain, or Wind in order to allow the storm to pass. Verification from the National Weather Service for an ALL CLEAR is also advised prior to re-commencing work.**

11.15 Access And Haul Road Plan (8.D.1)

Not Applicable

11.16 Demolition Plan (Engineering and Asbestos Surveys (23.A.01)

Not Applicable

11.17 Emergency Rescue (Tunneling) (26.A.05)

Not Applicable

11.18 Underground Construction Fire Prevention And Protection Plan (26.D.01)

Not Applicable

11.19 Compressed Air Plan (26.I.01)

Not Applicable

11.20 Formwork And Shoring Erection And Removal Plans (27.B.02)

Not applicable

11.21 Jacking Plan (Lift) Slab Plans (27.D.01)

Not Applicable

11.22 Safety and Health Plan and SSHP (26.A.05)

Refer to Appendix F

11.23 Blasting Plan (29.A.01)

Not Applicable

11.24 Diving Plan (30.A.13)

Not Applicable

11.25 Plan for Prevention of Alcohol and Drug Abuse (Defense Federal Acquisition Regulation Supplement (DFARS) Subpart 252.223-7004)

It is TN&A's desire to provide a drug-free, healthful, and safe workplace. To promote this goal, employees are expected to report to work in appropriate mental and physical condition to perform their jobs in a satisfactory manner.

While on TN&A premises and while conducting business-related activities off TN&A premises, no employee may use, possess, distribute, sell, or be under the influence of alcohol or illegal drugs. The legal use of prescribed drugs is permitted on the job only if it does not impair an employee's ability to perform the essential functions of the job effectively and in a safe manner that does not endanger themselves or other individuals in the workplace. When indications of use or impairment are present, employees may be requested to undergo blood, breath, urine or other drug or alcohol testing. Failure to agree to undergo testing may result in termination of employment.

Employees with questions or concerns about substance dependency or abuse are encouraged to discuss these matters with the Human Resources Department to receive assistance or referrals to appropriate resources in the community.

As a federal contractor, TN&A is required to abide by the Drug-Free Workplace Act of 1988. The Act requires TN&A to prepare and distribute an anti-drug policy statement prohibiting any drug-related activity in the workplace. Certain TN&A federal contracts may require pre, post, and interim alcohol and drug testing. Employees will be required to comply with the testing program while employed on these projects or be subject to disciplinary action.

The Act mandates that employees must, as a condition of employment, abide by the terms of this policy and report any conviction under a criminal drug statute for violations occurring on or off company premises while conducting company business. The report is to be made within five (5) days of the conviction to a member of TN&A's management.

Pursuant to the Drug-Free Workplace Act of 1988, the employer must notify the contracting federal agency of any such conviction within ten (10) days of being notified by the employee.

Violations of this policy may lead to disciplinary action, up to and including immediate termination of employment, and/or required participation in a substance abuse rehabilitation or treatment program. Such violations may also have legal consequences.

Employees with questions on this policy or issues related to drug or alcohol use in the workplace should raise their concerns with the Human Resources Department without fear of reprisal.

11.26 Fall Protection Plan (Section 21)

Refer to Appendix H for the Fall Protection Plan

11.27 Steel Erection Plan (27.E.01)

Not Applicable

11.28 Night Operators Lighting Plan (16.C.19.D)

Not Applicable

11.29 Site Sanitation Plan (Section 02)

Cool potable drinking water is available at the field trailer located on-site. Toilet facilities are also located on-site and are maintained to be kept in a sanitary condition on a regular basis.

11.30 Fire Prevention Plan (09.A.01)

- Field trailer equipped with portable fire extinguishers.
- Trucks equipped with portable fire extinguishers.
- Remediation systems building equipped with a sprinkler system.
- Fire extinguishers will be kept in close proximity to any portable gas fueled pumps generators saws, etc and the associated fuel tank.

12.0 AIR MONITORING

Personnel exposure monitoring will be conducted on TN&A employees who may be exposed to organic solvents and particulates above their respective OELs. Exposure samples will be collected that are representative of a full shift including at least one sample for each job classification in each work area either for each shift or for the shift with the highest exposure level. Workers who are likely to encounter organic solvents are those in the following exposure groups:

- Changing of Bag Filters
- Changing of Particulate Filters
- Cutting / Repairing Conveyance Piping
- Receiving Caustic Treatment Chemicals
- Accessing GAC Tanks
- Control of Hazardous Energy (Lockout Tagout) Activities
- Changing Elements on H202
- General Site Tasks General to all O&M Monitoring and Operating Parameters
- Wellhead Monitoring

12.1 REAL TIME AIR MONITORING ACTION LIMITS AND INITIAL EXPOSURE ASSESSMENTS

Level D PPE will be utilized while real-time air monitoring is being performed. A real-time aerosol monitor will be utilized to measure airborne dust levels in general areas and personal breathing zones by the SITE MANAGER/SSHO when conducting cutting and repairing of conveyance piping systems and changing of particulate filters and bag filters. If real-time air monitoring indicates that exposure levels are at or near designated action limits, site workers may be required to upgrade to respiratory protection if engineering controls can not eliminate the hazard.

A photoionization detector (PID) and a flame ionization detector (FID) will be utilized to conduct real time monitoring of organic vapor monitoring during routine O&M activities to determine problem areas and leaks. In addition, PID and FID sampling will be conducted during well head sampling and accessing the GAC tanks. The use of PID and FID sampling will allow real time analysis of low, mid and higher weight hydrocarbons.

If an upgrade to respiratory protection is necessary, personal air sampling will be conducted. Personnel will remain in Level C PPE until the results of initial exposure assessments are received. Only if exposure levels are below respective contaminant of concern Threshold Limit Values® will workers be allowed to downgrade PPE. They will also be trained in the use of respiratory protection and they will be informed about the exposure hazards they may encounter in their work.

The above-mentioned exposure monitoring results will be compared to the actions levels listed below:

Table 5. Air Monitoring Action Levels

Monitoring Instruments	Activity	Action Level	Site Action
Personal Exp Monitoring for organic vapor	Routine O&M activities, well head sampling and accessing the GAC tanks	10 ppm (1) 25 ppm - STEL (2) > 25 ppm	Wear Level D PPE Wear Level C PPE \ Stop work. Call SHM
Personal Exp Monitoring for particulate	Cutting and repairing of conveyance piping systems and changing of particulate filters and bag filters.	5.0 mg/m3 PNOS (3) > 5.0 mg/m3 PNOS > 10 mg/m3 PNOS	Wear Level D PPE Wear Level C PPE Stop work. Call SHM

1 – based on the TLV for TCE (ACGIH, 2007)
2 – based on the STEL for TCE (ACGIH, 2007)
3 – based on the recommended OEL for particulates not otherwise specified (ACGIH, 2007)

The SITE MANAGER/SSHO will collect all air measurements as specified in this section in each work area. Air monitoring results will be recorded in the site safety logbook and will be made available for review by site personnel.

Employees who had personal exposures to designed contaminants measured will receive a written letter with their test results. This letter will be delivered no later than five days after receipt of air monitoring results. All employees will be notified of any levels of concern by posting air monitoring results on the bulletin board and through discussions during the next daily safety meeting.

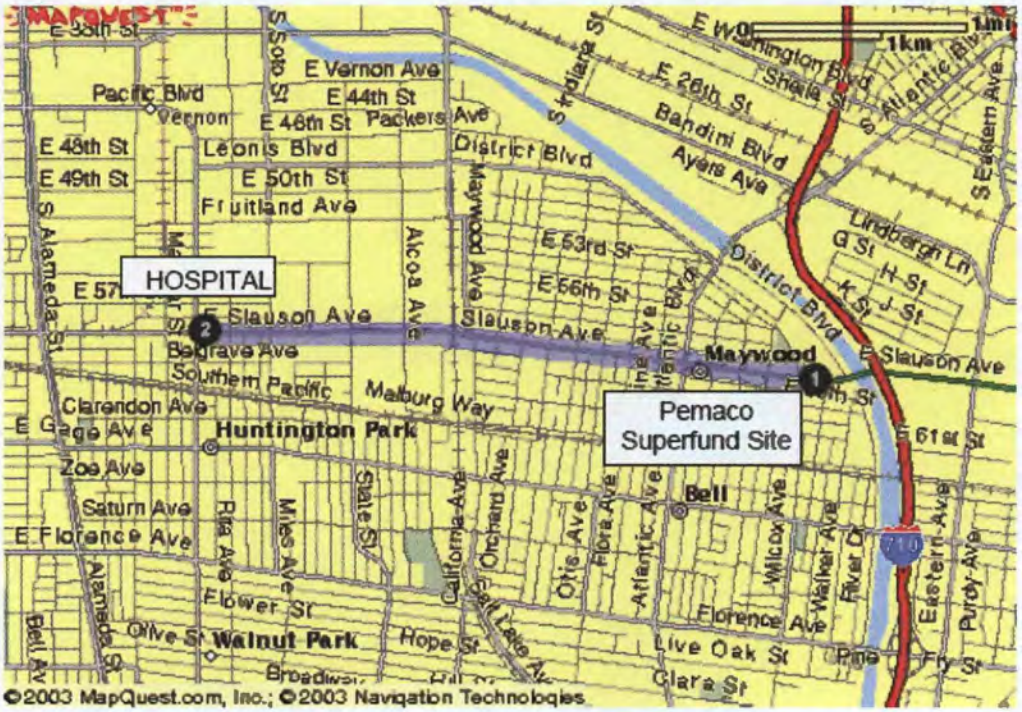
Air monitoring will be conducted at a frequency necessary to fully characterize each work activity, changed conditions that could result in new exposures, and all representative workers engaged in the aforementioned work activities. The extent, frequency, and duration of exposure monitoring will be decided by the SITE MANAGER/SSHO and SHM based on-site specific conditions and prior air monitoring results.

FIGURES

Figure 1: Site Location
Pemaco Superfund Remediation Site
Maywood, CA

FIGURE 2
Hospital Location Map and Directions

Pemaco Superfund Remediation Site
Maywood, CA



SCALE 1:24000

Legend

Community Hospital of Huntington Park
2623 E. Slauson Blvd., Huntington Park, CA
(323) 583-1931

DATE:	FILE NAME:	APPROVED BY:
11/5/2000	PEMACO-SL	

SITE LOCATION MAP
Pemaco Superfund Site
Maywood, California

T N & A — T N & Associates, Inc. Engineering and Science

Figure 1

Directions to Community Hospital of Huntington Park:

Approximately ¾ mile from site directly west on Slauson Ave.

APPENDIX A

Activity Hazard Analysis Tables

APPENDIX A

Activity Hazard Analysis Tables

Activity Hazard Analyses Tables (AHAs)

Activity Hazard Analyses Tables (AHAs) are supplemental the existing TN&A site specific site safety and health plan. Before any operation of either the groundwater or vapor treatment systems, a thorough review of the site specific H&S plan should be performed.

Note: These AHAs were prepared by

JACOB & HEFNER ASSOCIATES, P.C
Engineers • Surveyors • Environmental
And submitted on May 23, 2007 as part of the

OPERATION AND MAINTENANCE MANUAL

PEMACO Superfund Site
5050 Slauson Avenue
Maywood, California

They have been reviewed and expanded upon by
William S. Fink, CIH, CSP, CHMM,
TN&A Corporate Safety and Health Manager

Activities	Health Hazards	Control Procedures
Changing of bag filters	Exposure to contaminated groundwater	1. PPE: Level D including cuff length nitrile gloves. 2. EYE PROTECTION: Full face shield or safety glasses for splash protection and vinyl or similar apron available as needed. 3. Monitoring with PID in the breathing zone. Action level > 10 PPM in breathing zone requires upgrade to Level C with ventilation in the treatment compound using overhead fans. 4. Bag Filters will be initially changed and inspected when the pressure differential reaches 5-10 PSI and groundwater flow is reduced by 25%. Any excess pressure will be bled off through the stopcock into a 5-gallon bucket. The liquid accumulated in the 5-gallon bucked will be poured back into the sump and pumped through the groundwater system. 5. Disposal of bag filters: Used bag filters will be placed in a used 55-gallon drum and labeled as IDW waste. 6. In the event of a spill during bag filter change out floor decon will be performed using absorbent material and disposed of in a 55-gallon drum labeled as IDW waste. 7. Booster tank filters run as EITHER/OR. F-401 is default bag filter. F-402 is to be used temporarily when F-401 is being changed out. 8. Holding tank filters, F-403 and F-404, run in parallel. Procedure for changing out is to valve off one while the other is changed out or to shutdown holding tank pump, P-402, if more time is needed and both can be changed out simultaneously.

Activities	Health Hazards	Control Procedures
Changing particulate filters	Exposure to contaminated vapors	1. PPE: Modified Level D including tyvek suits with cuff length nitrile gloves. SHUT DOWN VAPOR TREATMENT SYSTEM PRIOR TO CLEANING AIR PARTICULATE FILTERS. 2. EYE PROTECTION: Safety glasses must be work when air particulate filters are replaced. 3. Monitoring with PID in the breathing zone. Action level > 10 PPM in breathing zone requires upgrade to Level C with ventilation in the treatment compound using overhead fans. 4. Air particulate filters will be initially cleaned and replaced when the pressure differential reaches 5-10 PSI. Filters consist of outer foam pre-filter to catch coarse size materials and an inner paper cartridge to remove finer size particles. Once the filter cartridges are removed the vessels will be vacuumed to remove particles that have fallen to the bottom. 5. Foam pre-filters will be cleaned and replaced. If paper cartridges are clean they will be re-installed. If the paper cartridges are clogged the cartridges will be disposed of and replaced with new cartridges. Removed cartridges will be placed in a 55-gallon drum and labeled as IDW waste.
Cutting / Repairing Conveyance Piping	Exposure to contaminated groundwater Fall Protection for elevated work	1. Groundwater system will be shut down. 2. The pipe will be isolated through valuing. Excess pressure will be bled-off through sample ports or bag filter bleeder valves. In the event that none of these methods are possible for relieving pressure, then a 5-gallon bucket and absorbent will be placed beneath the appropriate true union fitting and breaking the fitting and allowing it to spill into the 5-gallon bucket will slowly relieve the pressure. Dispose of bucket in same manner as bag filter disposal of excess liquid. 3. Need to evaluate pipe supports prior to breaking union or flange to ensure that the cross pipe is not supported by the joint to be broken. Support as needed. 4. Fall protection must be incorporated for high elevation work. Safety harness shall be used and tied off to marked tie off points marked with yellow paint.

Activities	**Safety and Health Hazards**	**Recommended Control Procedures**
Cutting/Repairing Conveyance Piping; Accessing systems at height >6 ft above ground level	Falls, injury and death	Use of manlifts, jacks, elevated work platforms with engineered fall protection equipment and systems. Refer to Appendix H – Fall Protection Plan

Activities	Health Hazards	Control Procedures
Receiving Caustic	Exposure to Caustic Fall Protection for elevated work	1. PPE: Modified Level D including tyvec suits with elbow length thick rubber gloves. SHUT DOWN VAPOR TREATMENT SYSTEM PRIOR TO REFILLING CAUSTIC. 2. EYE PROTECTION: Full face shield must be work when working around or transferring caustic. 3. Caustic will be transferred from tanker truck to caustic tank, T-901 by caustic truck driver/technician. A minimum 10' radius around the tanker and caustic technician shall be maintained during caustic tank fill operations. 4. If caustic comes in contact with skin, flush immediately with water for at least 15 minutes. Eye wash station is located directly across from caustic tank, T-901. Monitor skin for irritations. If irritations appear to worsen after flushing with water, see medical attention. 5. For any maintenance on caustic tank, a platform ladder with safety harnesses tied off will be used in conjunction with at least a two man team. One person designated spotter for caustic spills. 6. In the event of a caustic spill floor decon will be performed using absorbent material and disposed of in a 55-gallon drum labeled as CAUSTIC waste. A caustic spill kit is located next to the caustic tank, T-901.
Accessing GAC tanks	Fall Protection for elevated work	1 Groundwater or vapor treatment system will be shut down. 2. Fall protection for high elevation work will include use of a safety harness attached to the tie-off point, (marked with yellow paint) located on the steel "I" beam above the liquid GAC. All work will be conducted on the steel grate above the liquid GAC. 3. Vapor GAC work may have to be conducted using a platform ladder with a safety harness tied off. 4. All high elevation work will involve at least two people with one person designated as a spotter.

Activities	Health Hazards	Control Procedures
Lock Out / Tag Out (LOTO)	Electric Shock	1. PPE: Level D. SHUT DOWN GROUNDWATER OR VAPOR TREATMENT SYSTEM PRIOR TO PERFORMING LOCK OUT / TAG OUT (LOTO) activities. 2 EYE PROTECTION: Safety glasses must be worn at all times when work is being performed in the treatment plant 3. Go to the electrical room and find the appropriate breaker for the equipment to be LOTO. Flip breaker to OFF position. Attach appropriate size lock to lock out breaker and retain key until lock is removed. Attach tag referencing person or persons responsible for LOTO and contact numbers until system is safe to re-energize 4. Go to local control panel and verify with a voltmeter that power has been disconnected. If there is no local control panel (i.e. pumps) verify that no power is present at the electrical connections to the device.
Changing elements on H-202	Burns	1 PPE: Level D including cuff length nitrile gloves. 2. EYE PROTECTION: Safety goggles. 3. Perform LOTO and de-energize heater. 4 Verify with volt-meter that unit is de-energized. Allow 30 minutes for unit to cool or use a temperature gun to confirm that heater and heating elements are cool.
General site tasks common to all O&M monitoring & operating parameters	Exposure to Airborne Dust	1. Stand up-wind whenever intrusive activities occur and generate visible signs of airborne dust. 2. Monitor air for airborne soil dust (surface or subsurface soil) with portable aerosol dust-direct reading instrument 3. Utilize wet methods (spraying ground, etc.) when visible signs of airborne dust are generated, using precautions to avoid the development of runoff. 4. > 2.5 mg/M3 in breathing zone requires upgrade to Level C with air purifying respirators with particulate filters 5. > 50 mg/ M3 in breathing zone requires upgrade to Level B. Approval for Level B must first be approved by SSHO.

Activities	Health Hazards	Control Procedures
General site tasks common to all O&M monitoring & operating parameters	Exposure to Chemical Products (See site specific MSDS)	1. Stand up-wind of chemical products whenever possible. 2. Minimize contact and contact time with chemical products. 3 Avoid walking through discolored areas, puddles, leaning on drums, or contacting anything that is likely to be contaminated. Proper boots made of compatible materials and/or shoe coverings, must be worn if contaminated ground is unavoidable. 4. Do not eat, drink, smoke, and/or apply cosmetics in the hot or warm zones. 5. Wear gloves when in contact with contaminated surfaces 6. Eye protection must be worn at a minimum. 7. Splash goggles must be worn when working with liquids. 8. > 5 ppm organic vapors in breathing zone requires upgrade from level C. 9. > 50 ppm organic vapors in breathing zone requires upgrade from level C to Level B. 10 If unknown materials are encountered, call the SSHO.
	Exposure to Unidentified Hazardous Materials	1. Stand up-wind of hazardous materials whenever possible. 2. An isolated and controlled staging area secured from unauthorized personnel must be provided for safe evaluation and handling of these materials. 3. Only informed and authorized personnel are allowed in staging area. 4. A specific work plan must be developed prior to sampling and evaluation of unidentified hazardous materials for "hazardous materials categorization". 5. Once identified, hazardous materials must be separated into zones based on (at a minimum). chemical compatibility, reactivity criteria, combustibility/flammability, radioactivity and extremely hazardous materials (which may include high toxicity explosivity, and/or any of the aforementioned criteria).

Activities	Health Hazards	Control Procedures
General site tasks common to all O&M monitoring & operating parameters	Noise	1. Hearing protection is required when measured sound pressure levels (SPL) exceed 85 dB (A) where employees stand or conduct work. 2. Wear hearing protection when working around equipment such as a drill rig, jackhammer, cut saw, air compressor, blower or other heavy equipment is operating on the site. System equipment, the liquid ring pumps, PD blower, and FTO generate 113 dB in the plant 3. Wear hearing protection whenever you need to raise your voice appreciably above normal conversational speech due to a loud noise source; this much noise may indicate the need for protection.
	Electric Shock	1. Maintain appropriate distance from overhead utilities; 20-foot minimum clearance from power lines required, 10-foot minimum clearance from shielded power lines. 2. Use ground-fault circuit interrupters as required. 3 Perform lockout/tag out procedures. 4. Use three-pronged plugs and extension cords 5. Contact your local underground utility-locating service prior to conducting intrusive (subsurface) work. 6. Follow code requirements for electrical installations in hazardous locations. 7 Do not work around wet areas near electrical sources without special provisions approved by the SSHO.
	Physical Injury	1. Wear hard hats and safety glasses when on-site 2. Maintain visual contact with the equipment operator and wear orange safety vest when heavy equipment is used on-site. 3 Avoid loose fitting clothing. 4 Prevent slips, trips and falls; keep work area clean and uncluttered. 5. Keep your hands away from moving parts. 6. Test the emergency shut-off switch for the treatment system.

Activities	Health Hazards	Control Procedures
General site tasks common to all O&M monitoring & operating parameters	Back Injury	1. Use a mechanical lifting device or a lifting aid where appropriate. 2. If you must lift, plan the lift before doing it. 3. Check your route for clearance. 4. Bend at the knees and use leg muscles when lifting. 5. Use the buddy system when lifting heavy or awkward objects. 6 Do not twist your body while lifting.
	Ladders	1. Make sure ladder rungs are sturdy and free of cracks. 2. Use ladders with secure safety feet. 3 Pitch ladders at a 4:1 ratio. 4. Secure ladders at the top when possible. 5. Use only free standing ladders for access to top of air particulate filters. 6. Use non-conductive ladders near electrical wires.
	Fire Control	1. Smoke only in designated areas. NO SMOKING IN THE TREATMENT PLANT. 2. Keep flammable liquids in closed and approved containers. 3. Keep site clean; avoid accumulating combustible debris such as paper. 4. Follow Hot Work Safety Procedures when welding or performing other activities requiring an open flame. 5. Isolate flammable and combustible materials from ignition sources. 6. Ensure fire safety integrity of equipment installations.

Activities	Health Hazards	Control Procedures
General site tasks common to all O&M monitoring & operating parameters	Cleaning Equipment	1. Wear appropriate PPE to avoid skin and eye contact with isopropyl alcohol, Alconox, or other cleaning materials. 2. Stand upwind to minimize any potential inhalation exposure. 3. Dispose of spent cleaning solutions and rinses accordingly.
	Heat Stress	1. Increase water intake while working. 2. Increase number of rest breaks and/or rotate workers in shorter work shifts; take breaks in shaded areas. 3. Watch for signs and symptoms of heat exhaustion and fatigue. 4. Plan work for early morning or evening during hot months. 5. Use ice vests as necessary. 6. Rest in cool, dry areas. 7. In the event of heat stroke, bring the victim to a cool environment and call 911.
Stagnant Water	Mosquitoes Disease	1. Be aware that whenever there is stagnant water especially in the treatment plant sump or condensate sumps there is the possibility of mosquito infestation. 2. Pump down condensate sumps as indicated by the indicator lights on panel. 3. Remove all residual water from plant sump after sump pump has pumped down sump, using a shop vac and empting the water back into the groundwater booster tank, T-401. No standing water is allowed on site.

Activities	Health Hazards	Control Procedures
Well Head monitoring	Vault Entry	1. Remove vault cover using proper lifting techniques. Always use the buddy system when performing wellhead monitoring. 2. Promote natural ventilation by opening the space to fresh air. 3. Conduct remote air monitoring prior to entry to monitor for contaminants and available oxygen. 4. Implement fresh air intrinsically safe blower system. 5. Have standby attendant if necessary. 6. Enter if safe; conduct continuous air monitoring. 7. Remove vault cover using proper lifting techniques. Make sure vault covers lock in place when open. Using compressed air, blow out vault nuts and bushings. 8. Promote natural ventilation by opening the space to fresh air. 9. Conduct remote air monitoring prior to entry to monitor for contaminants and available oxygen. 10. Implement fresh air intrinsically safe blower system and/or upgrade to level B or A if necessary, with approval by SSHO. 11. Have standby attendant if necessary. 12. Enter if safe; conduct continuous air monitoring.
	High Crime Areas	1. Be aware of surroundings. 2. Use the buddy system. 3 Request police detail when appropriate. 4. Limit work during daylight hours when possible.
	Insects	1. Tuck pants into socks. 2. Wear long sleeves. 3. Use insect repellent.

Activities	Health Hazards	Control Procedures
Well Head monitoring	Poisonous Plants (Such as poison ivy, oak or sumac)	1. Don't enter areas infested with poisonous plants. 2. Immediately wash any areas that come into contact with poisonous plants. 3. Wear protective clothing (long sleeves, pants) if necessary to enter area. 4. Put affected clothing into plastic garbage bags, segregating them from contaminating other contact surfaces and materials. 5. Do not attempt to clear area with fire or pollen/dust producing operations such as weed whacking.
	Vehicular Traffic	1. Wear traffic safety vest when vehicle hazard exists. 2. Use cones, flags, barricades, and caution tape to define work area. 3. Use vehicle to block work area. 4. Engage police detail for high-traffic situations.
	Inclement Weather	1. Stop outdoor work during electrical storms and other extreme weather conditions such as extreme heat or cold temperatures. 2. Take cover indoors or in vehicle. 3. Listen to local forecasts for warnings about specific weather hazards such as tornadoes, hurricanes, and flash floods.
	Welding, Cutting and Brazing	1. Conduct fire safety evaluation. 2. Complete Hot Work Permit 3. Ensure flammable materials are protected from hot work, sources of ignition. 4. Ensure fire watch/fire extinguisher is on standby by hot work location. 5. Wear appropriate eye shielding.

Equipment to be Used	Required Inspections	Training
Heavy Equipment – Fork Lifts Trucks, Manlifts, Jacks, PPE – Modified Level D and C Air Monitoring Equipment - PID Hand Tools/Power Tools	Daily Safety Inspection Inspect tools/equipment before use Calibrate air monitoring equipment before/after use Inspect PPE before use	40-hour OSHA HAZWOPER training 3-day supervised field training 8-hour OSHA HAZWOPER Supervisor training OSHA 10-hr Construction Safety Training Site-Specific Safety training and AHA training Equipment Training O&M Training and Systems Safety Training First Aid/CPR/AED training Forklift license

Analyzed/ Approved By:	Position or Title	Signature
	SSHO	
	Construction Manager	

APPENDIX B

Heat Stress

Heat Stress Hazards

	Cause	Symptoms	Treatment	Prevention
Heat Rash	Hot humid environment; plugged sweat glands.	Red bumpy rash with severe itching.	Change into dry clothes and avoid hot environments. Rinse skin with cool water.	Wash regularly to keep skin clean and dry.
Sunburn	Too much exposure to the sun.	Red, painful, or blistering and peeling skin.	If the skin blisters, seek medical aid. Use skin lotions (avoid topical anesthetics) and work in the shade.	Work in the shade; cover skin with clothing; apply skin lotions with a sun protection factor of at least 15. People with fair skin should be especially cautious.
Heat Cramps	Heavy sweating drains a person's body of salt, which cannot be replaced just by drinking water.	Painful cramps in arms, legs or stomach which occur suddenly at work or later at home. Heat cramps are serious because they can be a warning of other more dangerous heat-induced illnesses.	Move to a cool area; loosen clothing and drink cool salted water (1 tsp. salt per gallon of water) or commercial fluid replacement beverage. If the cramps are severe or don't go away, seek medical aid.	Reduce activity levels and/or heat exposure. Drink fluids regularly. Workers should check on each other to help spot the symptoms that often precede heat stroke.
Fainting	Fluid loss and inadequate water intake.	Sudden fainting after at least two hours of work; cool moist skin; weak pulse.	GET MEDICAL ATTENTION. Assess need for CPR. Move to a cool area; loosen clothing; make person lie down; and if the person is conscious, offer sips of cool water. Fainting may also be due to other illnesses.	Reduce activity levels and/or heat exposure. Drink fluids regularly. Workers should check on each other to help spot the symptoms that often precede heat stroke.
Heat Exhaustion	Fluid loss and inadequate salt and water intake causes a person's body's cooling system to start to break down.	Heavy sweating; cool moist skin; body temperature over 38°C; weak pulse; normal or low blood pressure; person is tired and weak, and has nausea and vomiting; is very thirsty; or is panting or breathing rapidly; vision may be blurred.	GET MEDICAL AID. This condition can lead to heat stroke, which can kill. Move the person to a cool shaded area; loosen or remove excess clothing; provide cool water to drink; fan and spray with cool water.	Reduce activity levels and/or heat exposure. Drink fluids regularly. Workers should check on each other to help spot the symptoms that often precede heat stroke.
Heat Stroke	If a person's body has used up all its water and salt reserves, it will stop sweating. This can cause body temperature to rise. Heat stroke may develop suddenly or may follow from heat exhaustion.	High body temperature (over 41°C) and any one of the following: the person is weak, confused, upset or acting strangely; has hot, dry, red skin; a fast pulse; headache or dizziness. In later stages, a person may pass out and have convulsions.	CALL AMBULANCE. This condition can kill a person quickly. Remove excess clothing; fan and spray the person with cool water; offer sips of cool water if the person is conscious.	Reduce activity levels and/or heat exposure. Drink fluids regularly. Workers should check on each other to help spot the symptoms that often precede heat stroke.

Screening Criteria for Heat Stress Exposure Using the Wet Bulb Globe Temperatue (WBGT) Thermometer (WBGT Values in °C)

	Acclimatized				Unacclimatized			
Work Demands	Light	Moderate	Heavy	Very Heavy	Light	Moderate	Heavy	Very Heavy
100% Work	29.5	27.5	26		27.5	25	22.5	
75% Work; 25% Rest	30.5	28.5	27.5		29	26.5	24.5	
%0% Work; 50% Rest	31.5	29.5	28.5	27.5	30	28	26.5	25
25% Work; 75% Rest	32.5	31	30	29.5	31	29	28	26.5

WBGT values are calculated using the following equations:

- With direct exposure to sunlight:

$WBGT_{out} = 0.7T_{nwb} + 0.2T_g + 0.1T_{db}$

- Without direct exposure to the sun:

$WBGTi_{in} = 0.7T_{nwb} + 0.3T_g$

Where:

T_{nwb} = natural wet bulb temperature (sometimes called NWB)

T_g = globe temperature (sometimes called GT)

T_{db} = dry bulb (air) temperature (sometimes called DB)

APPENDIX C

Accident Prevention Program Forms And Material Safety Data Sheets

Pre-Mobilization Safety Check List

Site Safety and Health Inspection Form

Heavy Equipment Certification Form

Hot Work Permit

Accident Reports (including)

General Liability Report –
Property Damage and Loss –

Vehicle Accident Report –
for TN&A Vehicles

Accident Investigation Report

Near Miss Occurrence Report

Investigating Accidents

DAILY SAFETY TAILGATE MEETING FORM

VISITOR SIGN-IN LOG

HAZARDOUS MATERIALS INVENTORY LOG

T N & Associates, Inc.
Engineering and Science

Pre-Mobilization Safety Check List

A knowledgeable T N & Associates, Inc. (TN&A) project management representative shall fill out this form after the Site-Specific Health and Safety Plan has been completed. When completed, a copy shall be given to the Project Site Health and Safety Officer or Project Health and Safety Officer (before mobilizing site personnel or equipment). A copy shall be forwarded to the Corporate Health and Safety Manager.

Job Name:_____ **Today's Date**_____

Owner/Client_____

Project Address_____

Person Filling Out This Form (Name)_____

Your Relation to the Project_____

How many workers (including subcontractors) are expected on the job?_____

What is the starting and completion date of the project?_____

Administration And Meetings	**Yes**	**No**	**N/A**	**Date**
1. Is there a copy of the TN&A Site Specific Health and Safety Plan (HASP) on Site?				
2. Is there a copy of the TN&A Hazard Communication Program and MSDS manual on site?				
3. Is there a copy of the TN&A Corporate Health and Safety Manual on site?				
a. Personal Acknowledgment Form				
b. Daily Safety Tool Box Talk Record				
c. Respirator Test Fit Form				

Administration And Meetings Continued	**Yes**	**No**	**N/A**	**Date**
d. Accident and Crisis Management Forms				
e. Real Time Air Monitoring Logs, and Monitoring Equipment Calibration Forms				
f. OSHA 300 Form, as necessary.				
g. Job Site Posters				
4. Have TN&A site employees been trained for tasks to be performed? (This includes having records on file)				
5. Have employees received base line Medical Examinations? (This includes having records on file)				
6. Have employees been trained and properly fitted for respirators?				
7. Is there a TN&A Telephone Directory on site?				

T N & Associates, Inc.
Engineering and Science

Pre-Mobilization Safety Check List

Administration And Meetings Continued	Yes	No	N/A	Date
8. Is there a field logbook on site to include Health and Safety issues?				
9. Have subcontractors provided evidence of their employee training documents and written procedures?				
10. Have special licenses or permits been obtained from city, county, state, or others?				
Medical Support	**Yes**	**No**	**N/A**	**Date**
11. Are First Aid supplies are on hand and adequate for the project?				
12. Are eye rinse stations or bottles been obtained for work areas?				
13. Are nearest emergency medical facility hours and telephone numbers known and posted? (Includes calling facilities to ensure service and phone numbers are still existing)				
14. Is there a phone system set up on site to call for emergency assistance?				
15. Is the phone system set up on 911 response?				
16. Is there a vehicle available for emergency transportation?				
17. Does a member of the crew hold First Aid and CPR Certification?				
Personal Protection Equipment (PPE)	**Yes**	**No**	**N/A**	**Date**
18. Is the following PPE available for employees?:				
a. Hard Hat				
b. Safety Glasses				
c. Safety Harness (full upright body harness only)				
d. Ear Plugs				
e. Gloves				
f. Is site-specific PPE available? (respirators, coveralls, etc.)				
g. Other:				
Support Areas And Supplies	**Yes**	**No**	**N/A**	**Date**
19. Have work zones boundaries been determined to keep unauthorized personnel out?				
20. Has artificial illumination been provided?				
21. Is there a hazard free area for employees to break and eat food?				
22. Are there facilities for employees to wash their hands?				
23. Are there trash bags for paper towels and contaminated PPE?				
24. Is there a safe source of drinking water available for employees?				
25. Has a smoking area been set up for employees? (with receptacle for butts)				

T N & Associates, Inc.
Engineering and Science

Pre-Mobilization Safety Check List

Support Areas And Supplies	Yes	No	N/A	Date
26. Have an adequate number of toilets been provided for site personnel?				
27. Are disinfectant moist towelettes provided (respirator/hand washing Level D)				
28. Have arrangements been made to control dust on the project?				
29. Is there cones and barricade tape for site control?				
Support Areas And Supplies Continued	**Yes**	**No**	**N/A**	**Date**
30. Has TyChem Chemtape 2 (or equivalent) been provided for sealing PPE?				
31. Is a Tell Tail for wind direction provided for contaminated areas				
32. Have compressed air horns been provided?				
Utilities – underground and overhead	**Yes**	**No**	**N/A**	**Date**
33. Has Diggers Hotline or local utility company been contacted?				
34. Has OSHA been notified of excavations where employees will enter at 5 feet in depth or greater? (California OSHA requirement)				
Equipment and Materials	**Yes**	**No**	**N/A**	**Date**
35. Are fire extinguishers available for use in vehicles, office(s), and applicable site areas?				
36. Has special equipment to control hazards been anticipated and provided for (i.e., shoring, air movers for ventilation, etc.)?				
37. Have storage areas for construction materials been designated?				
38. Will equipment used to handle materials (i.e., forklift, trucks, etc.) have room to operate safely?				
39. Are clearly designated traffic patterns, road layouts, and parking areas planned or existing?				
Controls For Personnel Protection	**Yes**	**No**	**N/A**	**Date**
40. Is the following equipment available for use and in working order?:				
a. Signs (Keep Out, Danger, Permit Required Confined Space, etc)				
b. Barricades (stand up)				
c. Barricade tape				
d. Flashers				
e. Orange Safety Vests				
f. Other				

T N & Associates, Inc.
Engineering and Science

Pre-Mobilization Safety Check List

Company Vehicular Operations	Yes	No	N/A	Date
41. Do the drivers have a valid driver's license?				
42. Are the safety devices on the vehicles in working order?				
43. Are safety checks conducted on vehicles prior to operating them?				
44. Are fire extinguishers and first aid kits and other safety equipment onboard vehicles present, in good condition, and inspected on a frequent basis?				
45. Are vehicles maintained on a regular maintenance schedule through the corporate fleet maintenance manager?				

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COMMENT SHEET

This section is reserved for responding to the items on previous pages that were answered "No." Please provide the line item number, and describe what is being done to change each item to "Yes."

Line #	Comments

T N & Associates, Inc.
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Line #	Comments (Continued)

T N & Associates, Inc.
Engineering and Science

Site Safety and Health Inspection Form

A knowledgeable T N & Associates, Inc. (TN&A) project management representative shall fill in each section and provide a copy to the Project Manager, Site Safety and Health Officer, and the Corporate safety and Health Manager. A sheet for comments is provided at the end of this form for observations that require explanation.

Job Name: _____ **Today's Date**_____

Owner/Client_____

Project Address_____

Person Filling Out This Form (Name)_____

Your Relation to the Project_____

Not OK	OK	N/A	
			Documentation and Meetings
___	___	___	1. Is there a copy of the TN&A Safety and Health Plan on site?
___	___	___	2. Is the TN&A Site-Specific Safety and Health Plan available for site personnel to read?
___	___	___	3. Is a map (with phone number and address) to a emergency medical facility, and job site posters posted in a conspicuous location?
___	___	___	4. Is there a current file with TN&A and subcontractor's medical and training records on site?
___	___	___	5. Is there a field logbook on site that includes recent entries on Safety and Health?
___	___	___	6. Are Daily Safety Tool Box Talks being conducted and documented?
			Medical Support
___	___	___	7. Are First Aid supplies adequate for the project?
___	___	___	8. Have eye rinse stations been up set for work areas?
___	___	___	9. Does a member of the crew hold First Aid and CPR Certification?
			Site Areas
___	___	___	10. Are designated traffic patterns, road layouts, and parking areas being followed by site personnel?
___	___	___	11. Are work zones boundaries established and effective to keep unauthorized personnel out?
___	___	___	12. Is lighting adequate to perform work safely?
___	___	___	13. Is dust on the project being controlled properly?

T N & Associates, Inc.
Engineering and Science

Site Safety and Health Inspection Form

Not OK	OK	N/A	
			Break Areas
___	___	___	14. Is there a safe area for employees to break and eat food with clean water, place to wash hands, and clean toilet facilities?
___	___	___	15. Is there a safe area for workers to smoke with a receptacle for extinguishing cigarettes?
			Personal Protection Equipment (PPE)
___	___	___	16. Are employees wearing the proper PPE for work performed?
			Equipment
___	___	___	17. Is equipment being inspected before use? (Tools, machines, etc.)
___	___	___	18. Has equipment purchased or rented been equipped with the necessary safety devices? (Horn, backup alarm, etc.)
			Storage Areas
___	___	___	19. Have storage areas been set up to store flammable (gas, oil, etc.) in a safe manner with MSDSs available?
___	___	___	20. Are containers clearly identified with labels and hazard warnings?
___	___	___	21. Is lumber being stored in a safe manner? (Hand stacked lumber mustn't be stacked more that 15 feet high. Machine stacked lumber mustn't be stacked more than 20 feet high)
___	___	___	22. Have storage areas been designed to keep oxygen and acetylene at least 20 feet apart?
___	___	___	23. Does equipment used to handle materials (i.e., forklift, trucks, etc.) have room to operate safely?
			Fire Prevention
___	___	___	24. Are there "No Smoking" signs posted in areas with flammables?
___	___	___	25. Are fire extinguishers available for use (charged with a current inspection tag, and safety pin and seal) in vehicles, office(s), and necessary site areas?
			Housekeeping & Construction Safety
___	___	___	26. Are the ends of rebar, metal stakes, (nails in lumber pulled) or other similar hazards removed, made visible or padded so that workers passing in isle ways are not impaled or injured?
___	___	___	27. Are work areas clear of *unnecessary* materials and debris?

Site Safety and Health Inspection Form

Not OK	OK	N/A	Housekeeping & Construction Safety (cont.)
___	___	___	28. Are framing or building structures able to support the loads that are placed on them?
___	___	___	29. Are persons protected from passing under buckets on pulley systems overhead hazards unaware?
___	___	___	30. Are personnel protected from masonry walls potentially collapsing while being constructed? (Limited access zone should be established for walls 4 feet in height on side without scaffold. Walls 8 feet or greater in height should be braced)
			Ladders
___	___	___	31. Do ladders appear to be in good condition and positioned on level ground?
___	___	___	32. Are ladders resting securely at top, unable to shift sideways with at least 3 feet of rail above the landing? (Should be tied off to the object on which it rests)
___	___	___	33. Are ladders positioned with the at least 1/4 forth of the length of the ladder (horizontal distance) between the bottom of the ladder and the object on which it rests?
___	___	___	34. Are workers working on, ascending, and descending ladders in a safe manner?
			Electrical Installations
___	___	___	35. Has lockout/tagout been performed to de-energized equipment?
___	___	___	36. Are workers wearing metal such as jewelry, or metal hard-hats or using metal ladders while working on equipment connected to a source of electrical power? (Mustn't be)
___	___	___	37. Have electrical panels (panels in service) been left open unattended? (Mustn't be)
___	___	___	38. Have work zones been barricaded with caution tape to keep other workers out of areas where high voltage or "live" work is being performed?
			Hand and Power Tools
___	___	___	39. Do power tools have safety devices in place consistent with the manufacturer's recommendations? (such as abrasive wheel guards on grinders)
___	___	___	40. When not in use, are power tools placed in a location or in a manner that is safe for persons working around them? (Tools should not be placed where they can trip persons unaware, or be energized with the trigger facing straight up while on the ground where they can be stepped on)
___	___	___	41. Are electrical cords in good condition, and protected from damage by vehicles or work activities?
___	___	___	42. Are electrically powered tools protected by the use of a ground fault circuit interrupter and assured grounding system?

Site Safety and Health Inspection Form

Not OK	OK	N/A	
			Welding, Cutting, and Brazing
___	___	___	43. Are welders adequately controlling sparks and slag from combustible or flammable materials around the work space?
___	___	___	44. Is there a check valve installed at the gauge of all compressed gas cylinders?
___	___	___	45. If necessary, are screens/shields provided to protect other personnel from welding arc rays?
___	___	___	46. Are gas hoses, electrical leads, and equipment in good condition?
			Excavations and Protective Systems
___	___	___	47. Has the utility company been contacted before excavating?
___	___	___	48. Has Cal-OSHA been notified that workers will be entering excavations that are 5 feet or greater in depth? (California Projects)
___	___	___	49. Is the competent person keeping a current log of excavation inspections?
___	___	___	50. Is heavy equipment (trucks, bulldozers, etc.) able to enter excavations without the threat of tipping or rolling over (have equipment ramps been provided)?
___	___	___	51. Is there a clear pathway (at least 2 feet) between excavations and spoil piles for workers to walk?
___	___	___	52. Are excavations barricaded to provide adequate visibility to workers and nearby traffic that excavations are present?
___	___	___	53. Are protective systems (shoring, benching, sloping) being used properly to prevent cave-in (to protect workers, adjacent roads, sidewalks and structures)?
___	___	___	54. Have ladders (or other safe means of egress) been provided in excavations?
___	___	___	55. Have excavations been inspected by the Competent Person on a daily basis and logged in the inspection log?

Site Safety and Health Inspection Form

Comment Sheet

This section is reserved for responding to the items on previous pages that were answered "Not OK" that need more explanation. Please provide the line item number, and describe what was observed and what is being done (or has been) to change each item to "OK."

Line #	Comment

T N & Associates, Inc.
Engineering and Science

Heavy Equipment Certification

TO: T N & Associates, Inc. (TN&A) **DATE:**_____

FROM:_____

Project Name_____

Project Location: _____

(1) This form provides certification of machinery and mechanized equipment to be used on the referenced project for the following work:

Description of equipment work:	
Project Site:	
Subcontractor providing equipment: Address:	
Dates (duration) of equipment work:	

(2) Inspection and certification of machinery and mechanized equipment, as required by TN&A has been made prior to, but within seven calendar days' advance, of use on the project site. Re-certification will be required for equipment that is used on the project site for more than one year.

	Identification of equipment (make, model, serial no.)	Date of Certification
1		
2		
3		

(3) The above listed equipment has been inspected and tested as indicated above, and is **certified to be in safe operating condition by the following competent individual:**

Name		Title
Company		
Signature		Date

(4) If there are any questions regarding this certification, please contact the following TN&A representative:

T N & Associates, Inc.
Engineering and Science

PEMACO SUPERFUND SITE
EQUIPMENT/VEHICLE INSPECTION RECORD

Date: Unit No.: Description:
Miles: Or Hours: Manufacturer:
Pick up location: Delivery Location:

	Good	Satisfactory	Repair Req.	N/A		Good	Satisfactory	Repair Req.	N/A
1. tires ___%*	☐	☐	☐	☐	16. Interior	☐	☐	☐	☐
2. Brakes	☐	☐	☐	☐	17. Glass	☐	☐	☐	☐
3. Steering	☐	☐	☐	☐	18. Wipers/Review mirrors	☐	☐	☐	☐
4. Undercarriage	☐	☐	☐	☐	19. Heater	☐	☐	☐	☐
5. Suspension	☐	☐	☐	☐	20. Safety Equipment/belts	☐	☐	☐	☐
6. Engine	☐	☐	☐	☐	21. Lights/turn signals	☐	☐	☐	☐
7. Drive Train	☐	☐	☐	☐	22. Mounted Equipment	☐	☐	☐	☐
8. Fuel System	☐	☐	☐	☐	23. Mounted attachments	☐	☐	☐	☐
9. Cooling System	☐	☐	☐	☐	24. Blade/Bucket	☐	☐	☐	☐
10. Electric System	☐	☐	☐	☐	25. Boom	☐	☐	☐	☐
11. Exhaust System	☐	☐	☐	☐	26. Outriggers	☐	☐	☐	☐
12. Hydraulic System	☐	☐	☐	☐	27. Fire ext./first aid kit	☐	☐	☐	☐
13. Transmission	☐	☐	☐	☐	28. Horn/backup Alarm	☐	☐	☐	☐
14. Clutch	☐	☐	☐	☐	29. _____	☐	☐	☐	☐
15. Body	☐	☐	☐	☐	30. _____	☐	☐	☐	☐

* The percentage of tread usefulness

Comments:_____

_____

_____

_____

_____

Inspected By: _____

T N & A T N & Associates, Inc.
Engineering and Science

HOT WORK PERMIT

All temporary operations involving open flames or producing heat and/or sparks require a Hot Work Permit. This includes, but is not limited to, Brazing, Cutting, Grinding, Soldering, Thawing, and Welding.

INSTRUCTIONS FOR FIRE SAFETY SUPERVISOR

1. Verify precautions listed at right (or do not proceed with the work).
2. Complete PERMIT and retain for job files.
3. Post COPY of PERMIT in vicinity of hot work.

DATE_____ **JOB NO.**_____

LOCATION/BUILDING & FLOOR (Be Specific)_____

DESCRIPTION OF WORK BEING PERFORMED_____

NAME OF PERSON DOING HOT WORK_____

The above location has been examined, the precautions checked on the Hot Work Checklist have been taken to prevent fire, and permission is authorized for this work.

SIGNED: _____(Fire Safety Supervisor)

SIGNED: _____(Person doing Hot Work)

SIGNED: _____(Fire Watch)

TIME STARTED: Date: _____Time: _____AM/PM

PERMIT EXPIRES: Date:_____ Time:_____ AM/PM

HOT WORK CHECKLIST

__ Sprinklers and hose streams in service/operable.

__ Hot Work Equipment in good condition (e.g., power source, welding leads, torches, etc.)

__ Multi-purpose fire extinguisher and/or water pump can.

HOT WORK PERMIT

REQUIREMENTS WITHIN 35 FEET OF WORK

__ Dust, Lint, Debris, Flammable Liquids and oily deposits removed.

__ Explosive atmosphere in area eliminated.

__ Combustible floors (e.g., wood, tile, carpeting) wet down, covered with damp sand or fire blankets.

__ Remove flammable and combustible material where possible. Otherwise protect with fire blankets, guards, or metal shields.

__ All wall and floor openings covered.

__ Walkways protected beneath hot work.

WORK ON WALLS OR CEILINGS

__Combustibles moved away from other side of wall.

WORK IN CONFINED SPACES

__Confined space cleaned of all combustibles (example: grease, oil, flammable vapors).

__Containers purged of flammable liquids/vapors.

__Follow provisions of confined space permit.

FIRE WATCH/HOT WORK AREA MONITORING

__ Fire watch will be provided during and for 30 minutes after work, including any coffee or lunch breaks. Note: this is required when combustibles are present in or near the 35-foot work zone.

__ Fire watch is supplied with an extinguisher, and/or water pump can, also making use of other extinguishers located throughout work area.

__ Fire watch is trained in use of this equipment and familiar with location of sounding alarm.

__ Fire watch may be required for opposite side of walls, above, and below floors and ceilings.

OTHER PRECAUTIONS TAKEN

_____

_____

HOT WORK PERMIT

FIRE WATCH SIGNOFF

__ Work area and all adjacent areas to which sparks and heat might have spread were inspected during the fire watch period and were found fire safe.

Signed: _____

FINAL CHECKUP (minimum 30 minutes after Hot Work)

__ Work area was monitored for _____hour(s) following Hot Work and found fire safe.

Signed: _____

T N & Associates, Inc.
Engineering and Science

ACCIDENT REPORTS

General Liability Report –
Property Damage and Loss –

To be completed in the event of equipment or other property damage

Vehicle Accident Report –
for TN&A Vehicles

Accident Investigation Report

to be completed by the supervisor to determine accident causes and corrective actions (TN&A FORM)

Near Miss Occurrence Report –

To be completed in the event of any "near miss" in which no property damage or personal injury occurred but may have occurred

T N & Associates, Inc.
Engineering and Science

GENERAL LIABILITY REPORT
PROPERTY DAMAGE AND LOSS

Facility Name and Address:	
Project Name/Number:	
Description of Property Damage or Loss:	
Estimated $ Value of Damage or Loss:	
Location of damaged/lost/stolen property (before loss):	
Were Pictures Taken of Damage? YES or NO	**Were Police Notified? Yes or NO** **Department:** **Report No.:**
Date and Time of Damage/Loss/Theft:	
Were Hazardous Materials Released? YES or NO	**If YES, describe materials:**
Owner of Damaged/Stolen Property: **Address:** **Telephone No:**	
Personal Injuries? YES or NO (If YES, complete the section below) ***Complete A TN&A Accident Investigation Report for injured employees***	
Injured parties: **1. Name:** **Employer:**	**Telephone No:** **Address:**
2. Name: **Employer:**	**Telephone No:** **Address:**

T N & Associates, Inc.
Engineering and Science

GENERAL LIABILITY REPORT

PROPERTY DAMAGE AND LOSS

Witnesses: **1. Name:** **Employer:**	**Telephone No:** **Address:**
2. Name: **Employer:**	**Telephone No:** **Address:**

Investigated by:	Print Name	Signature	Date
Employee			
Supervisor			

Reviewed by:	Print Name	Signature	Date
Corp. SHM			

Was this report sent or called into TN&A Corporate office? YES or NO

T N & Associates, Inc.
Engineering and Science

VEHICLE ACCIDENT REPORT

ACCIDENT DESCRIPTION

Accident Date	**Time:**
Location: City, State	
Description of Accident:	
Witness:	**Telephone No:**
Address:	
Police Officer:	**Department:**
❑ **Passengers? YES or NO** ❑ **Injuries? YES or NO**	❑ **Weather: Circle One** **Clear Cloudy Fog Rain Sleet Snow** **Other: Describe**
❑ **Pavement: Circle One** **Asphalt Steel Concrete Wood Gravel/Dirt Brick** **Other: Describe**	❑ **Conditions: Circle One** **Dry Wet Icy Pot Holes** **Other: Describe**
❑ **Roadway: Circle One** **Residential Divided Highway Undivided Highway** **No. of lanes in each direction:**	❑ **No. of Vehicle towed from scene:** ❑ **Number of Injuries** ❑ **Number of Fatalities**
❑ **Were Hazardous Materials Released? YES or NO** ❑ **If YES, describe materials:**	

Was vehicle accident report sent or called into TN&A Corporate office? YES or NO

VEHICLE ACCIDENT REPORT

TN&A VEHICLE

Driver:	License No:	State
Address	City:	State/ZIP:
Work Telephone:	Project Name/Number:	
Vehicle No. :	Make/Model/Year:	
License Plate No:		State:
Owner: Circle One TN&A Leased/Rented Private Owner		
Vehicle Type: Circle One Commercial Motor Vehicle Non-Commercial Motor Vehicle		
Owner Name:		Tel: No.:
Address:	City:	State/ZIP:
Vehicle Damage:		

OTHER VEHICLE

Driver:	License No:	State
Address	City:	State/ZIP:
Work Telephone:	Project Name/Number:	
Vehicle No.:	Make/Model/Year:	
License Plate No:		State:
Owner: Circle One TN&A Leased/Rented Private Owner		
Vehicle Type: Circle One Commercial Motor Vehicle Non-Commercial Motor Vehicle		
Owner Name:		Tel: No.:
Address:	City:	State/ZIP:
Vehicle Damage:		
Additional Information:		

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Vehicle Accident Report

Draw and name roadways showing each vehicle, direction of and travel and point of impact. Indicate travel before the accident with a solid line and post-accident movement with a broken line.
Key:_1=Your Vehicle; 2=Other Vehicle(s); 3=Pedestrian; 4=Stop Sign; 5=Yield; 6=Railroad

Completed by:	Print Name	Signature	Date
Employee			
Supervisor			
Project Manager			
Site Safety and Health Officer			

T N & Associates, Inc.
Engineering and Science

ACCIDENT INVESTIGATION REPORT

This report is to be completed following the injury or illness or TN&A personnel. Answer all questions as completely as possible. Forward this report to the TN&A Corporate Safety and Health office within 24 hours of the accident. See instructions for directions to complete this form.

IDENTIFICATION		
Date and Time of Accident:	Date Reported:	
Employee Involved:	Position:	Date Employed: Experience on the Job:
Location:		
Name of Project/Project No.:		
Supervisor:	Witnesses:	

INCIDENT			
Accident Resulted in: ❑ Injury ❑ Illness ❑ Property Damage	Recordability: ❑ First Aid ❑ Medical ❑ Lost Time	Nature of Injury: Part of Body:	Type of Accident:
Description of Accident:			

ANALYSIS
Describe Hazards, Unsafe Condition(s) or Acts:
Describe Underlying Cause(s) or Failures:

ACCIDENT INVESTIGATION REPORT

Describe Underlying Cause(s) or Failures:

CONTROLS
Recommended Corrective Action:
Action Taken:

FOLLOW UP: Scheduled:	Conducted By:

Investigated by:	Print Name	Signature	Date
Employee			
Supervisor			

Reviewed by:	Print Name	Signature	Date
Corp. EHSM			

ACCIDENT INVESTIGATION REPORT

Instructions:
Remember, an accident investigation is not designed to find fault or blame. It is an analysis to determine causes that can be controlled or eliminated.

IDENTIFICATION
This section is self-explanatory. When completing the form, complete the whole section.

INCIDENT
Accident resulting in: Check appropriate box
Recordability: Check appropriate box based on:

- First Aid – Resulted in a minor injury/treatment administered by trained first aider-on premises.
- Medical Treatment – Resulted in more serious injury/treatment administered by physician, emergency room-off premises.
- Lost Time – Employee missed more than ½ day from work.

Provide a brief description of the following:

- Nature of the injury – Principle physical characteristics/what happened to employee, i.e.; sprain, contusion, burn, laceration, etc.
- Part of body – Body part directly affected by injury, i.e.; hand, fingers, arm, back, shoulder, etc. Be specific.
- Type of accident – Brief classification of type of accident, i.e.; material handling (lifting, pulling, pushing), contact with hot substance, slip/trip/fall, struck by/against, fall from elevator, etc.

Description of Accident: Describe in detail what happened; where it happened; why it happened; how it happened; what materials, equipment or conditions were involved; when it happened, etc. Provide prompt, accurate, thorough information.

ACCIDENT INVESTIGATION REPORT

Instructions: (continued)

ANALYSIS

Describe all hazard(s), condition(s) or act(s) which contributed to the accident:

- Unsafe conditions – hazardous or unsafe physical condition or circumstance, i.e.; congested production area, improperly designed workstation or tools, spill (grease, oil, water, etc.) on the floor, inadequate lighting, poor housekeeping, defective equipment, weights handled, poor ventilation, etc.
- Unsafe acts – Unsafe work practice, i.e.; failure to place warning signs/tags/signals, leaving spills on floor, using defective equipment, horseplay, substance abuse, failure to use personal protective equipment, etc.

Describe all underlying cause(s) or failure(s) which contributed to the accident:

- Underlying causes/failures – Frequency or repetition of a task, improper postures, possible safety program deficiencies, i.e.; ineffective rules/regulations, ineffective employee training, inadequate or unsafe job procedure, etc.

CONTROLS

Unsafe conditions and unsafe acts are symptoms of the underlying causes of accidents. Accident investigations should strive to identify the *underlying* causes, and recommendations should address corrective actions, both administrative and physical in nature. Consideration should be given to the physical work environment, managerial controls, and individual characteristics all of which contribute to industrial actions.

FOLLOW UP

Once investigations are completed, they should be periodically reviewed. This will ensure that proper controls were implemented and that the corrective actions remain a part of the safety program.

The CEHSM is a good source to assist in conducting this review. The CEHSM can determine if the investigations are completed in a timely manner, if they are thorough and if they are accurate. The CEHSM will recommend any additional corrective action needed and monitor the implementation of any recommended controls.

T N & Associates, Inc.
Engineering and Science

NEAR MISS OCCURRENCE REPORT

This report is to be completed following a "near miss" incident that does not result in an injury or illness. Please answer all questions as completely as possible.

Forward this report to the TN&A Corporate Safety and Health office within 24 hours of the incident.

Date:	**Time of Incident:**
Location: City, State	
Name of Project/Project No.:	
Description of Near Miss Incident	
Name(s) of Witnesses:	**Telephone No:**
What unsafe physical condition(s) or unsafe act(s) contributed to the near miss?	
What systematic or management deficiencies contributed to the near miss?	
List corrective action items, responsible person, scheduled completion date:	

NEAR MISS OCCURRENCE REPORT

Investigated by:

	Print Name	Signature	Date
Employee			
Supervisor			

Reviewed by:

	Print Name	Signature	Date
Corp. EHSM			

T N & Associates, Inc.
Engineering and Science

INVESTIGATING ACCIDENTS

When investigating an accident,
try to find out:

- **What** happened (fall, spill, shock, etc.)?
- **When** (exactly) did it happen?
- **Where** (exactly) did it happen?
- **Who** was involved?
- **How** did it happen (including steps and events that preceded the incident)?
- **Why** did it happen?

How can similar events be prevented it the future

T N & A T N & Associates, Inc.
Engineering and Science

DAILY SAFETY TAILGATE MEETING FORM

Project Number: _____
Site Name: _____
_____
Date: _____
SSHO: _____

ITEMS TO BE DISCUSSED WITH ALL PROJECT PERSONNEL:

_____ Head and eye protection required on job – (hard hat, safety glasses)
_____ Other protective equipment required – (steel-toed boots, ear plugs, gloves, chemicals suit, etc.)
_____ Respiratory protective equipment, if required by Site conditions
_____ Materials expected to be encountered on job and exposure limits (gasoline, diesel fuel, hydraulic fluids, waste oil, lubricants, etc., and their respective OELs)
_____ Work zones and methods of security
_____ Decontamination procedures (discuss steam cleaning of all contaminated equipment and personnel hygiene)
_____ General safe work practices
_____ Emergency procedures (fire extinguishers, first aid, gas detectors, hospital directions, and emergency numbers)

Other Items Discussed:

_____

_____

_____

The following personnel were present for discussion of the topics listed above and have read and understand the contents of this Site Health and Safety Plan.

NAME	SIGNATURE	COMPANY	DATE

T N & Associates, Inc.
Engineering and Science

DAILY SAFETY TAILGATE MEETING FORM (continued)

NAME	SIGNATURE	COMPANY	DATE

T N & Associates, Inc.
Engineering and Science

DATE_____

VISITOR SIGN-IN LOG

OPERATION AND MAINTENANCE OF DUAL PHASE GROUNDWATER AND VAPOR TREATMENT SYSTEM PEMACO SUPERFUND REMEDIATION SITE

Visitor's Name	Employer's Name	Duties to be Performed	Name of Escort	Time IN	Time OUT

T N & Associates, Inc.
Engineering and Science

HAZARDOUS MATERIALS INVENTORY LOG

Project Name and Location:

OPERATION AND MAINTENANCE OF DUAL PHASE GROUNDWATER AND VAPOR TREATMENT SYSTEM PEMACO SUPERFUND REMEDIATION SITE

Mfger's Name/Use	Quantity	Hazardous Materials (%)	MSDS On File (YES / NO)	Storage Area	SITE MANAGER/ SSHO Approval (Initials)

T N & Associates, Inc.
Engineering and Science

HAZARDOUS MATERIALS INVENTORY LOG
(Continued)
Project Name and Location:

OPERATION AND MAINTENANCE OF DUAL PHASE GROUNDWATER AND VAPOR TREATMENT SYSTEM PEMACO SUPERFUND REMEDIATION SITE

Mfger's Name/Use	Quantity	Hazardous Materials (%)	MSDS On File (YES / NO)	Storage Area	SITE MANAGER/ SSHO Approval (Initials)

NIOSH Pocket Guide to Chemical Hazards

Trichloroethylene	**CAS** 79-01-6
$ClCH=CCl_2$	**RTECS** KX4550000
Synonyms & Trade Names Ethylene trichloride, TCE, Trichloroethene, Trilene	**DOT ID & Guide** 1710 160

Exposure Limits	NIOSH REL: Ca See Appendix A See Appendix C
	OSHA PEL†: TWA 100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 2 hours)

IDLH Ca [1000 ppm] See: 79016	**Conversion** 1 ppm = 5.37 mg/m^3

Physical Description
Colorless liquid (unless dyed blue) with a chloroform-like odor.

MW: 131.4	BP: 189°F	FRZ: -99°F	Sol(77°F): 0.1%
VP: 58 mmHg	IP: 9.45 eV		Sp.Gr: 1.46
Fl.P: ?	UEL(77°F): 10.5%	LEL(77°F): 8%	

Combustible Liquid, but burns with difficulty.

Incompatibilities & Reactivities
Strong caustics & alkalis; chemically-active metals (such as barium, lithium, sodium, magnesium, titanium & beryllium)

Measurement Methods
NIOSH 1022, 3800; OSHA 1001
See: NMAM or OSHA Methods

Personal Protection & Sanitation
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: No recommendation
Provide: Eyewash, Quick drench

First Aid (See procedures)
Eye: Irrigate immediately
Skin: Soap wash promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a

pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister/Any appropriate escape-type, self-contained breathing apparatus
Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact
Symptoms Irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen]
Target Organs Eyes, skin, respiratory system, heart, liver, kidneys, central nervous system **Cancer Site** [in animals: liver & kidney cancer]
See also: INTRODUCTION See ICSC CARD: 0081 See MEDICAL TESTS: 0236

NIOSH Pocket Guide to Chemical Hazards

Zinc oxide	**CAS** 1314-13-2
ZnO	**RTECS** ZH4810000
Synonyms & Trade Names Zinc peroxide	**DOT ID & Guide** 1516 143

Exposure Limits	NIOSH REL: Dust: TWA 5 mg/m^3 C 15 mg/m^3 Fume: TWA 5 mg/m^3 ST 10 mg/m^3
	OSHA PEL†: TWA 5 mg/m^3 (fume) TWA 15 mg/m^3 (total dust) TWA 5 mg/m^3 (resp dust)

IDLH 500 mg/m^3	**Conversion**

Physical Description
White, odorless solid.

MW: 81.4	BP: ?	MLT: 3587°F	Sol(64°F): 0.0004%
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 5.61
Fl.P: NA	UEL: NA	LEL: NA	

Noncombustible Solid

Incompatibilities & Reactivities
Chlorinated rubber (at 419°F), water [Note: Slowly decomposed by water.]

Measurement Methods
NIOSH 7502; OSHA ID121, ID143

Personal Protection & Sanitation Skin: No recommendation Eyes: No recommendation Wash skin: No recommendation Remove: No recommendation Change: No recommendation	**First Aid** (See procedures) Breathing: Respiratory support

Respirator Recommendations NIOSH/OSHA

Up to 50 mg/m^3: (APF = 10) Any dust, mist, and fume respirator/(APF = 10) Any supplied-air respirator

Up to 125 mg/m^3: (APF = 25) Any supplied-air respirator operated in a continuous-flow mode/(APF = 25) Any powered, air-purifying respirator with a dust, mist, and fume filter

Up to 250 mg/m^3: (APF = 50) Any air-purifying, full-facepiece respirator with a high-efficiency particulate filter/(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode/(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter/(APF = 50) Any self-contained breathing apparatus with a full facepiece/(APF = 50) Any supplied-air respirator with a full facepiece

Up to 500 mg/m^3: (APF = 1000) Any supplied-air respirator operated in a pressure-demand or other

positive-pressure mode
Emergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode/(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape: (APF = 50) Any air-purifying, full-facepiece respirator with a high-efficiency particulate filter/Any appropriate escape-type, self-contained breathing apparatus

Exposure Routes inhalation

Symptoms Metal fume fever: chills, muscle ache, nausea, fever, dry throat, cough; lassitude (weakness, exhaustion); metallic taste; headache; blurred vision; low back pain; vomiting; malaise (vague feeling of discomfort); chest tightness; dyspnea (breathing difficulty), rales, decreased pulmonary function

Target Organs respiratory system

See also: INTRODUCTION

Iron oxide dust and fume (as Fe)

CAS

1309-37-1

Fe_2O_3

RTECS

NO7400000
NO7525000 (fume)

Synonyms & Trade Names

Ferric oxide, Iron(III) oxide

DOT ID & Guide

1376 135 (spent)

Exposure Limits

NIOSH REL: TWA 5 mg/m^3

OSHA PEL: TWA 10 mg/m^3

IDLH

2500 mg/m^3 (as Fe) See: 1309371

Conversion

Physical Description

Reddish-brown solid. [Note: Exposure to fume may occur during the arc-welding of iron.]

MW: 159.7	BP: ?	MLT: 2664°F	Sol: Insoluble
VP: 0 mmHg (approx)	IP: NA		Sp.Gr: 5.24
Fl.P: NA	UEL: NA	LEL: NA	

Noncombustible Solid

Incompatibilities & Reactivities

Calcium hypochlorite

Measurement Methods

NIOSH 7300, 7301, 7303, 9102; OSHA ID121, ID125G
See: NMAM or OSHA Methods

Personal Protection & Sanitation

(See protection)
Skin: No recommendation
Eyes: No recommendation
Wash skin: No recommendation
Remove: No recommendation
Change: No recommendation

First Aid

(See procedures)

Breathing: Respiratory support

Respirator Recommendations

NIOSH
Up to 50 mg/m^3:
(APF = 10) Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95

filtering facepieces) except quarter-mask respirators. The following filters may also be used: N99, R99, P99, N100, R100, P100. Click here for information on selection of N, R, or P filters.
(APF = 10) Any supplied-air respirator
Up to 125 mg/m^3:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered air-purifying respirator with a high-efficiency particulate filter.
Up to 250 mg/m^3:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters.
(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode
(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece
Up to 2500 mg/m^3:
(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode
Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes

inhalation

Symptoms

Benign pneumoconiosis with X-ray shadows indistinguishable from fibrotic pneumoconiosis (siderosis)

Target Organs

respiratory system

1.0 Welding fumes

CAS

2.0

RTECS

ZC2550000

Synonyms & Trade Names

DOT ID & Guide

Synonyms vary depending upon the specific component of the welding fumes.

3.0 Exposure Limits

NIOSH REL: Ca See Appendix A

OSHA PEL†: none

IDLH

Ca [N.D.] See: IDLH INDEX

Conversion

Physical Description

Fumes generated by the process of joining or cutting pieces of metal by heat, pressure, or both.

Properties vary depending upon the specific component of the welding fumes.

Incompatibilities & Reactivities

Varies

Measurement Methods

NIOSH 7300, 7301, 7303
See: NMAM or OSHA Methods

Personal Protection & Sanitation

(See protection)
Skin: No recommendation
Eyes: No recommendation
Wash skin: No recommendation
Remove: No recommendation
Change: No recommendation

First Aid

(See procedures)
Eye: Irrigate immediately
Skin: Soap wash
Breathing: Respiratory support

Respirator Recommendations

NIOSH
At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a

pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus
Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter. Click here for information on selection of N, R, or P filters./Any appropriate escape-type, self-contained breathing apparatus
Important additional information about respirator selection

Exposure Routes

inhalation, skin and/or eye contact

Symptoms

Symptoms vary depending upon the specific component of the welding fumes; metal fume fever: flu-like symptoms, dyspnea (breathing difficulty), cough, muscle pain, fever, chills; interstitial pneumonitis; [potential occupational carcinogen]

Target Organs

Eyes, skin, respiratory system, central nervous system

Cancer Site

[lung cancer]

1.0 Carbonyl fluoride

CAS

353-50-4

2.0 COF_2

RTECS

FG6125000

Synonyms & Trade Names

Carbon difluoride oxide, Carbon fluoride oxide, Carbon oxyfluoride, Carbonyl difluoride, Fluoroformyl fluoride, Fluorophosgene

DOT ID & Guide

2417 125

3.0 Exposure Limits

NIOSH REL: TWA 2 ppm (5 mg/m^3) ST 5 ppm (15 mg/m^3)

OSHA PEL†: none

IDLH

N.D. See: IDLH INDEX

Conversion

1 ppm = 2.70 mg/m^3

Physical Description

Colorless gas with a pungent and very irritating odor. [Note: Shipped as a liquefied compressed gas.]

MW: 66.0	BP: -118°F	FRZ: -173°F	Sol: Reacts
VP: 55.4 atm	IP: 13.02 eV	RGasD: 2.29	
FI.P: NA	UEL: NA	LEL: NA	

Nonflammable Gas

Incompatibilities & Reactivities

Heat, moisture, hexafluoroisopropyl-ideneamino-lithium [Note: Reacts with water to form hydrogen fluoride & carbon dioxide.]

Measurement Methods

None available
See: NMAM or OSHA Methods

Personal Protection & Sanitation

(See protection)
Skin: Frostbite
Eyes: Frostbite
Wash skin: No recommendation
Remove: No recommendation
Change: No recommendation
Provide: Frostbite wash

First Aid

(See procedures)
Eye: Frostbite
Skin: Frostbite
Breathing: Respiratory support

Respirator Recommendations

Not available.
Important additional information about respirator selection

Exposure Routes

inhalation, skin and/or eye contact

Symptoms

Irritation eyes, skin, mucous membrane, respiratory system; eye, skin burns; lacrimation (discharge of tears); cough, pulmonary edema, dyspnea (breathing difficulty); chronic exposure: gastrointestinal pain, muscle fibrosis, skeletal fluorosis; liquid: frostbite

Target Organs

Eyes, skin, respiratory system, bone

APPENDIX D

Contractor Accident Experience Tables, Logs, and Forms

TN&A EHS Performance Summary Table
TN&A 2005 OSHA 300A Log
Safety Sentinel Program

T N & Associates, Inc.
Engineering and Science

TN&A EHS Performance Summary Table

Occupational Safety and Health Performance Statistics

Loss History	2007	2006	2005	2004	2003	Average
1) Experience Modification Rate (NCCI)	0.84	0.91	0.88	0.98	0.85	0.89
2) Total Employee Hours Worked by Calendar Year	134,611 (2nd Qtr YTD)	307,692	281,532	259,650	281,093	282,492
3) Total Number of Recordable Injuries and Illnesses	1	3	6	2	6	3.6
4) Total Recordable Incidence Rates (TRIR)	1.48	1.95	4.26	1.5	4.3	2.70
5) Number of Cases that Involved Days Away From Work	1	1	0	0	1	0.60
6) Lost Work Day Incidence Rate (LWDIR)	1.48	0.65	0	0	0.71	0.95
7) Number of Cases, Remained at Work, but Transferred or Restricted	1	2	1	0	1	0.80
8) Days Away, Restricted, Transferred (DART) Incidence Rate	1.48	2	0.7	0	1.4	1.12
9) Total Number of Fatalities	0	0	0	0	0	0

At the end of August 2006 TN&A employees worked over 1 Million hours in the field without a lost-time injury.

Note: In August 2006 TN&A incurred a lost time injury due to a carpal tunnel injury in an office setting.

TN&A employees actively working in field operations, from 2003 through 2007, worked over 1,242,024 hours (inclusive of 2007 1st Qtr). In March 2007 a TN&A employee (equipment operator/laborer) employed on a landfill project and assisting in installing shore erosion control injured his back and was out on recovery and light duty. This incident included 8 lost work days and 7 restricted work days.

T N & Associates, Inc.
Engineering and Science

Bureau of Labor Statistics (BLS) Injury/Illness Incidence Rate Comparisons

Year	2005		
Area	Private industry, all U.S.		
Supersector	Professional and business services		
Industry	Remediation services		
Case Type	TN&A	Private industry, all U.S.	Remediation Services (NAICS 562190)
Total	2.0	4.6	4.1
Days Away	0.7	1.4	1.0
Job Transfer/Restriction	1.3	1.0	1.0
DART	2.0	2.4	2.0

OSHA Form 300 Recordkeeping

TN & Associates, Inc. (TN&A) has employed more than 10 employees during the past three years.

TN&A has maintained the OSHA 300 and 200 forms as required by Federal Law.

Note: The Log of Work Related Injuries and Illness (OSHA Form 300) will be submitted upon request.

Substance Abuse Programs

TN&A has a substance abuse program which includes pre-employment, "for cause", and post accident employee drug and alcohol testing.

TN&A has a program in place that complies with the Federal Drug-Free Workplace Act.

T N & Associates, Inc.
Engineering and Science

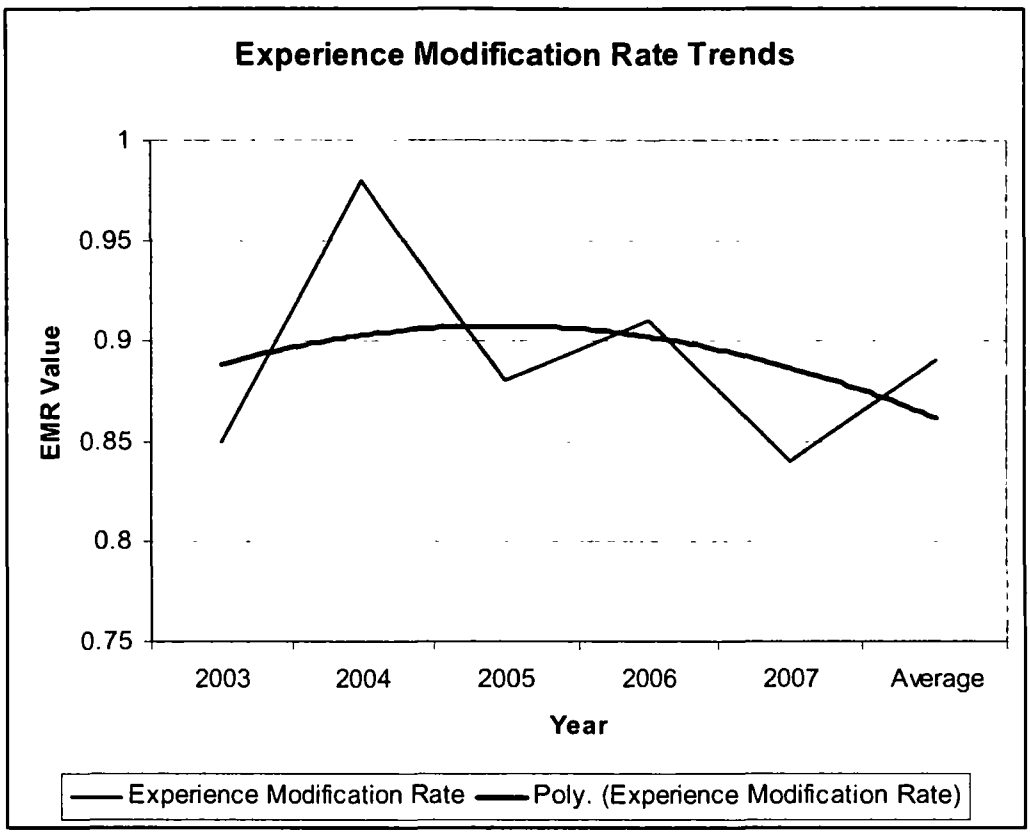
Environmental Health and Safety Program Elements

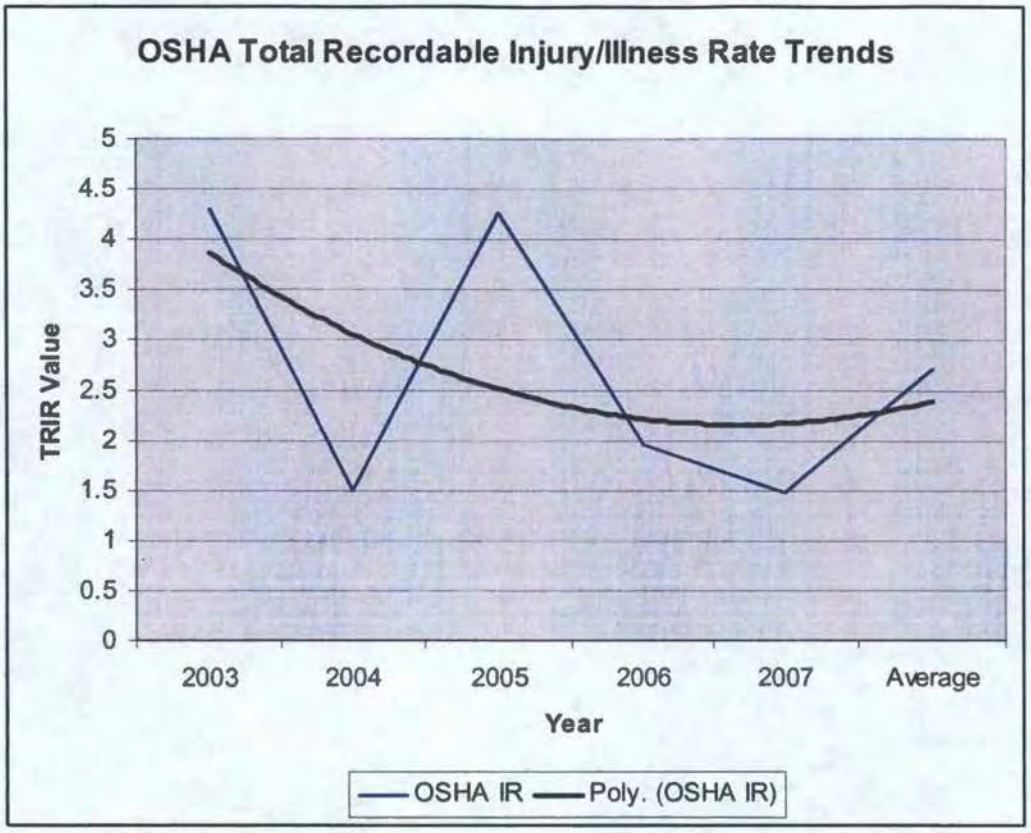
Written Health and Safety Programs	▪ Management Commitment and Policy regarding health and safety ▪ Company Health and Safety Program Manual ▪ Safe Operating Procedures for high hazard operations ▪ Written Respiratory Protection Program ▪ Written Hearing Conservation Program ▪ Written Hazard Communication Program ▪ Written Bloodborne Pathogen Program ▪ Written Medical Surveillance Program ▪ Written Lockout/Tagout Procedures ▪ Written Confined Space Entry Procedures
Worksite Evaluation and Analysis	▪ Formalized methods to identify and control high hazard operations ▪ Job or Task Hazard Analysis developed for hazardous operations ▪ Formalized accident/incident reporting and investigation process
Site Safety Meetings	▪ Daily "toolbox" site safety meeting requirement ▪ Weekly site safety meeting requirement ▪ Monthly site safety meeting requirement ▪ All employees required to attend site safety meetings ▪ Subcontractors required to attend site safety meetings
Environmental Health and Safety Inspections/Audits	▪ Line management participation in site EHS inspections/audits on a daily basis ▪ EHS specialist participation in site EHS inspections on a monthly or quarterly basis (project dependent) ▪ Written documentation of EHS inspection/audit findings ▪ Written documentation of EHS inspection/audit corrective actions
Environmental Health and Safety Training and Awareness Programs	▪ Safety training and orientation for new hires ▪ Safety training and orientation for line management ▪ Safety training and orientation for site supervisors/foremen ▪ Safety training and orientation for subcontractors ▪ Periodic employee/supervisor safety training ▪ Hazardous Waste (29 CFR 1910.120) trained workers
Environmental Programs	▪ Policy statement for environmental compliance or management ▪ Written program for environmental compliance or management ▪ Procedures for prevention and reporting of spills or releases ▪ Procedures for reporting permit exceedances ▪ Procedures for review/approval of waste management and/or transporter vendors or subcontractors

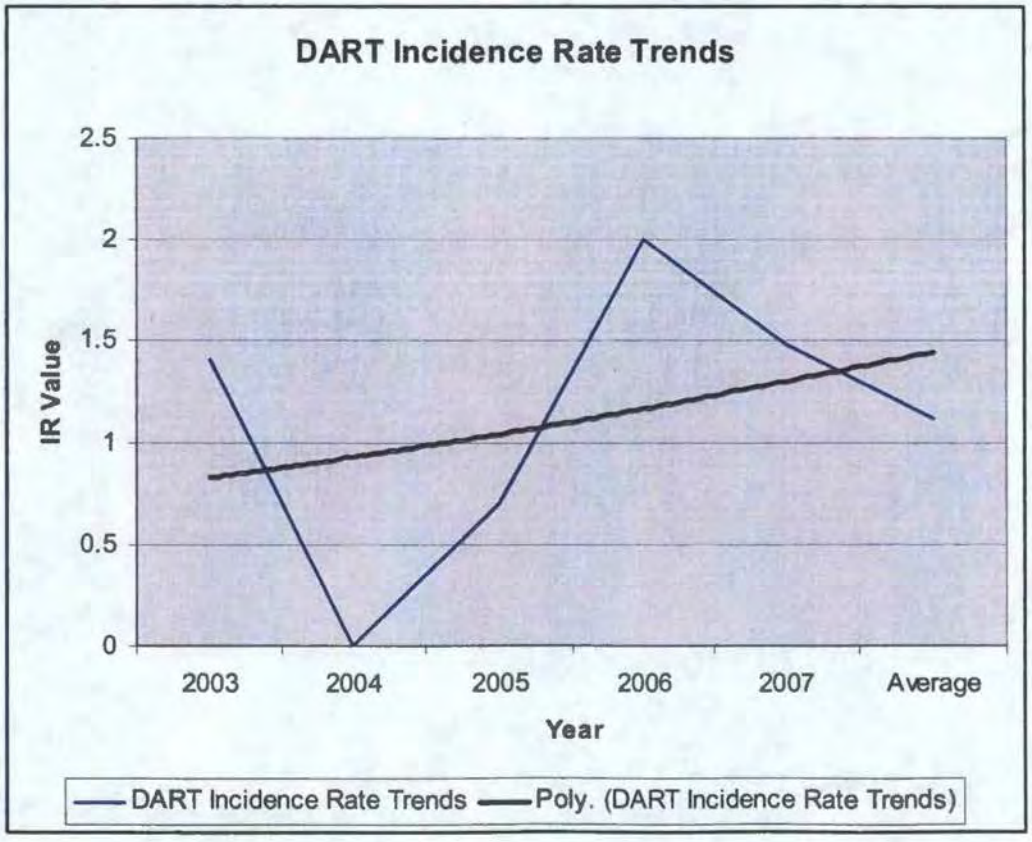
T N & Associates, Inc.
Engineering and Science

Corporate Safety Trend Analyses

The following graphs display trend analyses of EMR, OSHA IR, and DART. The linear trend analysis indicates that over the past five years TN&A has shown a consistent downward trend in all 3 categories.




OSHA Total Recordable Injury/Illness Rate Trends
TRIR Value
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
2003
2004
2005
2006
2007
Average
Year
OSHA IR
Poly. (OSHA IR)


DART Incidence Rate Trends
IR Value
2.5
2
1.5
1
0.5
0
2003
2004
2005
2006
2007
Average
Year
DART Incidence Rate Trends
Poly. (DART Incidence Rate Trends)

T N & Associates, Inc.
Engineering and Science

TN&A 2006 OSHA 300A Log

OSHA's Form 300A (Rev. 01/2004)
Summary of Work-Related Injuries and Illnesses

Year 2006

U S Department of Labor
Occupational Safety and Health Administration
Form approved OMB no. 1218-0176

All establishments covered by Part 1904 must complete this Summary page, even if no injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete.

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the log. If you had no cases, write "0."

Employees, former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR 1904.35, in OSHA's Recordkeeping rule, for further details on the access provisions for these forms.

Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
0	1	1	3
(G)	(H)	(I)	(J)

Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
71	35
(K)	(L)

Injury and Illness Types

Total number of	(M)		
(1) Injury	1	(4) Poisoning	0
(2) Skin Disorder	0	(5) Hearing Loss	0
(3) Respiratory Condition	0	(6) All Other Illnesses	1

Establishment information

Your establishment name: TN & Associates, Inc.

Street: 317 E. Main Street

City: Ventura State: CA Zip: 93001

Industry description (e.g., Manufacture of motor truck trailers):
Engineers and Scientists

Standard Industrial Classification (SIC), if known (e.g. SIC 3715):

OR North American Industrial Classification (NAICS), if known (e.g., 336212):
5 6 2 9 1 0

Employment information

Annual average number of employees: 245

Total hours worked by all employees last year: 307,612

Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

William S. Fink, C.H. CSP, CHMM — Company executive
Corp. S&H Mgr — Title

414-607-6779 — Phone
1.31.2007 — Date

Post this Summary page from February 1 to April 30 of the year following the year covered by the form.

Public reporting burden for this collection of information is estimated to average 58 minutes per response, including time to review the instructions, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any aspects of this data collection, contact: U.S. Department of Labor, OSHA Office of Statistics, Room N-3644, 200 Constitution Ave. NW, Washington, DC 20210. Do not send the completed forms to this office.

T N & Associates, Inc.
Engineering and Science

SAFETY SENTINEL PROGRAM

The Safety Sentinel Program is designed to reflect the outstanding Environmental Health and Safety (EHS) Management culture of our organization and to recognize the individuals striving to live that culture and incorporate Excellence and Quality in protecting the environment and promoting health and safety into their daily lives.

A Site Superintendent, a Site Safety and Health Officer, a Field Team Leader or a Project Manager (in fact – ANYONE!) can nominate an individual or a work group for the "Safety Sentinel" award.

The EHS Program Manager will discuss the merits of the nomination with the associated project managers, associates and our CEO to select "Safety Sentinel" award winners based on the following criteria.

- **Outstanding effort** to protect the Environmental Health and Safety (EHS) of personnel, the public and/or the environment.
- **Zero Incidents** on a major project.
- **Measurement** of leading indicators of EHS performance (i.e.; near misses, property damage or theft, environmental protection, first aid cases, OSHA recordable cases, safety meeting participation, employees trained, etc.) This indicates a proactive management of a project to protect and manage EHS.
- **Participation** of the work group with EHS Program Management goals including mandatory training programs and the medical surveillance program.
- **Continuous improvement** of the work group with EHS promotion on the job, looking for EHS performance improvement in the work process, adherence to the Site Safety and Health Plans for field work, holding tailgate safety meetings, weekly safety meetings, monthly safety meetings, forming a safety committee, requesting safety training videos and booklets from corporate safety library, and taking a pro-active interest in EHS management.

T N & Associates, Inc.
Engineering and Science

SAFETY SENTINEL
AWARD NOMINATION FORM

SAFETY SENTINEL NOMINEE(S)

Location:			
Individual Name:			
Work Group Name:			
Member Names:			
Project Name:			

Description of Outstanding EHS Performance and Contribution to Improving our Corporate Goal of Excellence in EHS Management and Commitment to Quality.

Nominated by:

Name:
Title:
Date:

Submit to William Fink, EHS Program Manager via e-mail at wfink@tnainc.com or via fax at (414) 257-2492.

Date Received by EHS Program Manager:
Date Reviewed with Award Committee:

APPENDIX E

APP Compliance Agreement

Contract Number: DACA45-00-P-0163; Task Order T019

Project Name: OPERATION AND MAINTENANCE OF DUAL PHASE GROUNDWATER AND VAPOR TREATMENT SYSTEM PEMACO SUPERFUND REMEDIATION SITE

The contract for the above project requires the following: that you be provided with and complete formal site-specific training; that you be supplied with proper personal protective equipment including respirators; that you be trained in its use; that you receive a medical examination to evaluate your physical capability to perform your assigned work tasks under the environmental conditions expected, while wearing the required personal protective equipment. These things are to be done at no cost to you.

By signing this certification, you are acknowledging that your employer has met these obligations to you.

I have read the plan, understand it and agree to comply with all of its provisions. I understand that I could be prohibited from working on the project for violating any of the safety requirements specified in the plan.

Name	Date

FORMAL TRAINING: I have completed the following formal training courses that meet OSHA's Hazardous Waste Operations and Emergency Response (HAZWOPER) requirements, as defined in 29 CFR 1910.120(e), "Training".

	Date Complete
Initial 40-hour training:	_____
3-day field supervised training:	_____
8-hour supervisory training:	_____
Annual 8-hour refresher training:	_____

SITE-SPECIFIC TRAINING: I have been provided and have completed the site-specific training required by this Contract. The Site Safety and Health Officer conducted the training

Date _____

RESPIRATORY PROTECTION: I have been trained in accordance with the criteria in the contractor's/my employer's Respiratory Protection Program. I have been trained in the proper work procedures and use limitations of the respirator(s) I will wear. I have been trained in and will abide by the facial hair policy.

Date _____

RESPIRATOR FIT-TEST TRAINING: I have been trained in the proper selection, fit, care, cleaning, and maintenance, and storage of the respirator(s) that I will wear. I have been fit-tested in accordance with the criteria in the contractor's/my employer's Respiratory Protection program and have received a satisfactory fit. I have been assigned my individual respirator. I have been taught how to properly perform positive and negative pressure fit check upon donning negative pressure respirator each time.

Date _____

MEDICAL EXAMINATION: I have had a medical examination within the last twelve (12) months, which was paid for by my employer. The examination included: health history, pulmonary function tests and may have included an evaluation of a chest x-ray. A physician made determination regarding my physical capacity to perform work tasks on the project while wearing protective equipment including a respirator. I was personally provided a copy of the results of that examination. My employer's industrial hygienist evaluated the medical certification provided by the physician and checked the appropriate blank below. The physician determined that there:

	Were no limitations to performing the required work tasks
	Were identified physical limitations to performing the required work tasks
	Date medical examination completed

CERTIFICATION

Employee's / Visitor's Signature	
Date	
Printed Name	

VERIFICATION

TN&A SSHO Signature	
Date	
Printed Name	

APPENDIX F

Site Safety and Health Plan

All elements of the SSHP as required by the EM 385-1-1

SECTION 28
HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE (HAZWOPER)

Are addressed in the APP and are referenced herein:

28.A.02 Hazardous Waste Cleanup Operations.
a. SSHP. Hazardous waste site cleanup operations require development and implementation of a SSHP that shall be attached to the APP as an appendix (APP/SSHP). The APP/SSHP shall address all occupational safety and health hazards associated with site cleanup operations. All contracted work on the cleanup projects shall be performed in compliance with the SSHP as well as the overall APP. Cleanup operations performed by in-house (Government) personnel do not require development of an APP, but shall be performed in compliance with local district safety and health policies for in-house activities and shall comply with the SSHP. Changes and modifications to the SSHP are permitted and shall be made in writing with the knowledge and concurrence of the safety and health manager (SHM) and accepted by the GDA.

b. The SSHP shall cover the elements listed in (1) through (14) in project specific detail. SSHP elements adequately covered elsewhere in the APP need not be duplicated.

(1) Site description and contamination characterization.
The SSHP shall provide a description of the contamination with the exposure potential to adversely affect safety and occupational health and likely to be encountered by the on-site work activities.

Refer to Section 2.2 - PROJECT DESCRIPTION AND SCOPE OF WORK in the APP

(2) Hazard/Risk analysis. An AHA shall be developed for each task/operation to be performed. The AHA shall comply with the requirements in 01.A.13. The AHA shall account for all hazards (classic safety, chemical, physical, biological, ionizing radiation) likely to be encountered while performing the work.

Refer to Appendix A in the APP

(3) Staff organization, qualifications, and responsibilities.
The following personnel are required for implementation of safety and occupational health requirements at cleanup operations.

(a) SHM. The SHM must be a Certified Industrial Hygienist (CIH), Certified Safety Professional (CSP), or Certified Health Physicist (CHP), dependent upon the contaminant-related hazards on the project (CIH for occupational health hazards, CSP for safety hazards, and CHP for ionizing radiation hazards). The SHM shall have 3 years of experience managing safety and occupational health at hazardous waste site cleanup.

Refer to Section 4.0 Responsibilities and Lines of Authorities in the APP. The SHM is William S. Fink, CIH, CSP, CHMM. Mr. Fink is an ABIH certified industrial hygienist with over 23 years of experience in the field. Mr. Fink will be responsible for all elements as described in section i through vii of this section.

(b) Site safety and health officer (SSHO). The SSHO shall have 1 year of experience implementing safety and occupational health procedures at cleanup operations, and have the training and experience to conduct
exposure monitoring/air sampling and select/adjust protective equipment use.

Refer to Section 4.0 Responsibilities and Lines of Authorities in the APP. The SSHO is Mr. Mark Prostko. He is a qualified and trained SSHO with over 20 years experience in the field. He will be responsible for all elements as described in section i through iv of this section.

(4) Training.
Personnel shall comply with the following general and project specific training requirements:
(a) General training. General training requirements apply to project personnel exposed to contaminant related health and safety hazards. General training must comply with the following requirements:
(i) 40-hour off-site hazardous waste site instruction.
Off-site instruction must comply with the 40-hour training requirements in OSHA standards 29 CFR 1910.120 and 29 CFR 1926.65.
(ii) 8-hour annual refresher training. Refresher training must comply with the requirements in OSHA standards 29 CFR 1910.120 and 29 CFR 1926.65.
USACE employees must comply with local district hazardous waste refresher training policies.
(iii) 3 days of field experience under the direct supervision of a trained, experienced supervisor.
(b) Supervisory training. On-site supervisors must comply with the 8-hour supervisory training requirements in OSHA standards 29 CFR 1910.120 and 29 CFR 1926.65.
(c) Project-specific training. The following project specific training shall be provided to workers before onsite work begins:

(i) Training specific to other sections of this manual or OSHA standards in 29 CFR 1910 and 29 CFR 1926 that are applicable to site work and operations.
(ii) Training covering each element in the SSHP.

Refer to Section 6.0 in the APP.

(5) PPE. PPE used to protect workers from site-related hazards (construction safety and health and contaminant related) shall comply with requirements specified in Section 5.

Refer to Section11.0 in the APP.

(6) Medical surveillance. All personnel performing on-site work that will result in exposure to contaminant-related health and safety hazards shall be enrolled in a medical surveillance program that complies with OSHA standards 29 CFR 1910.120 (f) and 29 CFR 1926.65 (f).

Refer to Section 10.1 Medical Surveillance and Fitness for Duty in the APP.

(7) Exposure monitoring/Air sampling program. Exposure monitoring and air sampling shall be performed to evaluate effectiveness of prescribed PPE and to evaluate worker exposure to site-related contaminants and hazardous substances used in the cleanup process. Project-specific exposure monitoring/air sampling requirements shall comply with requirements specified Section 6.

Refer to Section 13.0 Air Monitoring in the APP

(8) Heat and cold stress. The procedures and practices for protecting workers from heat and cold stress shall comply with the requirements 06.J.

Refer to Section 12.6.01 in the APP

(9) Standard operating safety procedures, engineering controls, and work practices. Safety and occupational health procedures, engineering controls and work practices shall be addressed for the following as appropriate:

Refer to Section 12 in the APP and Appendix A: Activity Hazard Analyses

(10) Site control measures. Work zones shall be established so that on-site activities do not spread contamination. The site shall be set up so that there is a clearly defined exclusion zone (EZ) and a clearly defined support zone (SZ) with a contamination reduction zone (CRZ) as a transition between the EZ and SZ.

Site Control Measures and Communications

WORK ZONES

Because this site is a long term remediation system with a fixed location and fixed operating systems there will not be three distinct, contamination control zones established to prevent the spread of contamination outside of the work area. Instead, regulated work zones will be placed around each designated maintenance work area as necessary to prevent non-authorized site personnel from entering active work areas and interfering with site operations. These work zones will be demarcated using barricades or warning tape or ropes. Only properly trained and equipped site workers will be allowed access to these regulated work areas. The location of these work zones will change depending on work activities and schedule. Workers will be informed of all active work areas during the daily tailgate safety meetings.

The area outside of the regulated work zones will contain provisions for team communications and serve as a staging area for equipment, office facilities, and emergency response resources. Access to safety equipment such as emergency eyewash, fire extinguishers, first aid kits, air horns and other equipment will be made as easily accessible as possible during maintenance activities.

Visitors will not be allowed to enter active work zones unless they are escorted, are wearing a minimum of Level D PPE, and have reviewed and signed the APP/SSHP.

COMMUNICATIONS

Communications within the regulated work zones will be by verbal command or hand signals. Cellular telephones will be used for off-site communications. All site personnel will have immediate access to these telephones or will have direct radio communications to someone with telephone service available. The telephone numbers for all emergency services, including the telephone numbers for TN&A project personnel, are provided in Section 12 of the APP. These telephone numbers will be posted at the site office and in each site vehicle.

(11) Personal hygiene and decontamination. A personal hygiene and decontamination station shall be set up in the CRZ for personnel to remove contaminated PPE and to wash when exiting the EZ.

DECONTAMINATION

Because the work site is a remediation system it is possible that contamination with hazardous materials may happen. Therefore, emergency eyewash and deluge shower stations are located in the remediation building.

Personnel wearing Level D PPE will remove their hard hats, safety glasses, leather gloves, hearing protectors, and outer protective garments prior to leaving the site and store them in a clean area for reuse the next day. They will then wash their hands and face before leaving the site.

(12) Equipment decontamination. An equipment decontamination station shall be set up in the CRZ for equipment to be decontaminated when exiting the EZ.

Not determined to be necessary for remediation system O&M operations. In place decontamination of equipment will take place for wellhead monitoring.

(13) Emergency equipment and first aid. The equipment and personnel required for first aid and CPR shall comply with the requirements in Section 3. Emergency equipment required to be on-site shall have the capacity to respond to project-specific emergencies. Site emergencies may require (but should not be limited to) PPE and equipment to control fires, leaks and spills, or chemical (contaminant or treatment process) exposure.

Refer to Section 12.2 and 12.3 of the APP.

(14) Emergency response and contingency procedures. An ERP shall be developed that addresses the following emergency response and contingency procedures:

Refer to Section 12.2 of the APP.

APPENDIX G

Confined Space Entry Program

TN & Associates, Inc.
Operation and Maintenance of Dual Phase Groundwater and Vapor Phase Treatment System
Pemaco Superfund Site
Accident Prevention Plan –
Section 12.26 Fall Protection Plan (SECTION 21)

STANDARD PRACTICE INSTRUCTION

SUBJECT: Fall Protection Program

REGULATORY STANDARDS:

- USACE Safety and Health Requirements Manual
  - (EM 385-1-1; Section 21 – Safe Access and Fall Protection)
- OSHA - 29 CFR 1910.66
- 29 CFR 1910.128, 129, 130, 131, (Proposed)
- 29 CFR 1926.104
- 29 CFR 1926.500
- Equivalent CalOSHA standards

BASIS: Approximately 300,000 disabling injuries occur in work-related falls each year. 85% of workers surviving falls lose time from their jobs. This poses a serious problem for exposed workers and their employer. The OSHA Safety Standards establish uniform requirements to make sure that the hazards elevated falls in U.S. workplaces are evaluated, and that this hazard information is transmitted to all affected workers.

GENERAL: This Company will ensure that the hazards of all elevated falls over 6 feet in length, within our facilities are evaluated, and that information concerning their hazards is transmitted to all employees. This standard practice instruction is intended to address comprehensively the issues of; evaluating potential fall hazards, communicating information concerning these hazards, and establishing appropriate protective measures for employees.

RESPONSIBILITY: The SITE MANAGER/SSHO is responsible for the administration of this program and has full authority to make necessary decisions to ensure success of the program. All site personnel are responsible for safety at all times. This company has expressly authorized this person to halt any company operation where there is danger of serious personal injury.

Contents of the Fall Protection Program

Fall Protection Program

1. Written Program. The company will review and evaluate this standard practice instruction:

- On an annual basis
- When changes occur to USACE EM 385-1-1, 29 CFR and CalOSHA standards, that prompt revision of this document
- When facility operational changes occur that require a revision of this document
- When there is an accident or close-call that relates to this area of safety
- Review the program any time fall protection procedures fail

Effective implementation of this program requires support from all levels of management within this company. This written program will be communicated to all personnel that are affected by it. It encompasses the total workplace, regardless of the number of workers employed or the number of work shifts. It is designed to establish clear goals, and objectives.

2. Statement of Policy. The hazards of potential falls at heights of 6 feet and above will be addressed in this document. This instruction describes a systematic approach that must be used to protect and prevent people from falling. This instruction also lists some of the most common fall hazards, and provides recommendations and guidelines for selecting fall arrest systems.

3. Facility/Department Evaluation. The workplace will be assessed before each assigned job for potential fall hazards. Proper fall arrest equipment will be used for jobs requiring fall protection when elimination of the hazard(s) is not possible. This company will evaluate the facilities by department to determine fall hazards. This preliminary evaluation will detail the required steps for protecting employees from fall hazards. A fall hazards assessment sheet (see appendix) will be used to document fall hazard assessments. A complete list of fall hazard locations and protective measures procedures will be maintained.

Pemaco Superfund Site Fall Hazard Location List

Department	Specific Fall Hazard Location	Date Evaluated	Remarks
Treatment Bldg	**Liquid system GAC change out; Overhead piping work; FTO scrubber stack removal and; Subsequent roof repair**	**July 2007**	

4. Training. A training program will be provided for all employees who will be exposed to fall hazards in the work area, and will be conducted by competent personnel. The program will include but will not be limited to:

- A description of fall hazards in the work area
- Procedures for using fall prevention and protection systems
- Equipment limitations
- The elements encompassed in total fall distance
- Prevention, control and fall arrest systems
- Inspection and storage procedures for the equipment

Generally, workers will be trained to recognize the hazards of falling from elevations and to avoid falls from grade level to lower levels through holes or openings in walking/working surfaces. Training programs will include prevention, control and fall arrest systems. It must be ensured that appropriate fall arrest systems are installed, and that employees know how to use them before beginning any work that requires fall protection.

4.1 Initial training. Training will be conducted prior to job assignment. This employer will provide training to ensure that the purpose, function, and proper use of fall protection is understood by employees and that the knowledge and skills required for the safe application, and usage is acquired by employees. This standard practice instruction will be provided to, and read by all employees receiving training. The training will include, as a minimum the following:

4.1.1 Types of fall protection equipment appropriate for use.

4.1.2 Recognition of applicable fall hazards associated with the work to be completed and the locations of such.

4.1.3 Load determination and balancing requirements.

4.1.4 Procedures for removal of protection devices from service for repair or replacement.

4.1.5 All other employees whose work operations are or may be in an area where fall protection devices may be utilized, will be instructed to an awareness level concerning hazards associated with fall protection operations.

4.1.6 Fall protection equipment identification. Fall protection equipment having identification numbers will be checked for legibility. Fall protection equipment having illegible identification markings will be turned in to the supervisor for inspection.

4.1.7 Equipment maintenance and inspection requirements.

4.1.8 Equipment donning and doffing procedures.

4.1.9 Equipment strengths and limitations.

4.1.10 Certification. This employer will certify that employee training has been accomplished and is being kept up to date. The certification will contain each employee's name and dates of training. Training will be accomplished by competent personnel.

4.2 Refresher training. This standard practice instruction will be provided to, and read by all employees receiving refresher training. The training content will be identical to initial training. Refresher training will be conducted on a semi-annual basis or when the following conditions are met, whichever event occurs sooner.

4.2.1 Retraining will be provided for all authorized and affected employees whenever (and prior to) a change in their job assignments, a change in the type of fall protection equipment used, or when a known hazard is added to the work environment which affects the fall protection program.

4.2.2 Additional retraining will also be conducted whenever a periodic inspection reveals, or whenever this employer has reason to believe, that there are deviations from or inadequacies in the employee's knowledge or use of fall protection equipment or procedures.

4.2.3 Whenever a fall protection procedure fails.

4.2.4 The retraining will reestablish employee proficiency and introduce new or revised methods and procedures, as necessary.

4.2.5 Certification. This employer will certify that employee training has been accomplished and is being kept up to date. The certification will contain each employee's name and dates of training. Training will be accomplished by competent personnel.

5. Fall Hazard Control Procedures (Fall Prevention).

5.1 Control Procedures Development. Once a facility evaluation has been accomplished, procedures will be developed, documented and utilized for the control of potential fall hazards. Fall prevention plans will be designed by company competent individuals or other competent personnel. Company engineers (where utilized) or other competent personnel will be provided with any required specialized training to recognize fall hazards, to understand and address fall prevention techniques, and to become familiar with fall arrest equipment and procedures. It is critical that they consider fall protection design for the safety of operations where employees must work at elevated heights. Safety during access and egress from elevated work sites will also be considered. The following guidelines will be used when planning work at elevated heights:

- Involve the Safety Department early in the project planning/job planning so that they can recommend appropriate fall-protection measures and equipment.
- Involve qualified Engineers when load rating of anchorage points must be determined or is in doubt. Required training will be provided as necessary.
- Involve Engineering and Maintenance when anchorage points must be installed.
- The Safety Officer and Engineering Departments will use the expertise of fall protection equipment manufacturers such as Rose Manufacturing Company., Miller Equipment Company, Research and Trading Company and DBI/SALA.
- This Company will be specific in dealing with fall hazards when developing contracts. Contractors will be required to provide a written fall protection program which describes the Contractors' fall protection policies and procedures when they will be working at elevated heights.

5.2 Procedural Format. The following format will be followed when developing fall protection procedures. The Safety Officer will be responsible for the implementation of these procedures. The procedures will clearly and specifically outline the scope, purpose, authorization, rules, and techniques to be utilized to control fall hazards, and the means to enforce compliance including, but not limited to, the following:

5.2.1 A specific statement of the intended use of the procedure.

5.2.2 A review of accident records, including OSHA 300 logs and Workers' Compensation documentation.

5.2.3 Interviews with employees and groups of employees whose work environment includes or may include fall hazards.

5.2.4 Physical observations of the work environment(s) that involve fall hazards or the potential of such.

5.2.5 Observations of individuals and their job tasks and work habits that expose them to existing or potential fall hazards.

5.2.6 The procedures contained in the company fall protection program.

5.2.7 Specific procedural steps for the use and operation of body harness systems, and other fall protection systems.

5.2.8 Specific procedural steps for the placement, erection, inspection, maintenance, disassembly and transfer of fall protection systems or devices and the person(s) responsible for them.

5.2.9 Specific requirements for testing fall protection systems or equipment to determine and verify the effectiveness of the fall protection control measures (not load testing).

5.2.10 The correct procedures to rescue employees who have fallen.

5.2.11 The role of each employee in fall protection plans and applicable policies.

5.2.12 Specific requirements for testing fall protection systems or equipment.

6. **Protective Materials and Hardware**. Appropriate fall protection devices will be provided for potential fall hazards. Selection of the equipment will be based on the fall protection evaluation. Evaluations will be conducted by the following personnel authorized to evaluate fall protection requirements:

Duty Title

1. John Wingate, PE, TN&A Construction Superintendent/Quality Control Manager

2.Mark Prostko, O&M System Site Manager/SSHO

3. William S. Fink, CIH, CSP, CHMM, TN&A Corporate Health and Safety Manager/Associate

6.1 Selection Criteria.

6.1.1 Fall Protection devices will be singularly identified; will be the only devices(s) used for controlling falls; will not be used for other purposes; and will meet the following requirements:

6.1.1.1 Capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected.

6.1.1.2 Anchor points will not deteriorate when located in corrosive environments such as areas where acid and alkali chemicals are handled and stored.

6.1.1.3 Capable of withstanding the ultimate load of 5,000 lbs. for the maximum period of time that exposure is expected.

6.1.1.4 Standardization within company facilities. Fall protection devices will be standardized whenever possible.

7. Fall Protection Systems. When fall hazards cannot be eliminated through any other means, fall arrest systems will be used to control falls. Proper training on the use of fall arrest equipment is essential and will be provided prior to use.

7.1 Full Body Harness Systems. A full body harness system consists of a full-body harness, lanyard, energy shock absorber, and self-locking snap hook. Before using a full-body harness system, the supervisor and/or the user must address such issues as:

7.1.1 Has the user been trained to recognize fall hazards and to use fall arrest systems properly?

7.1.2 Are all components of the system compatible according to the manufacturer's instructions?

7.1.3 Have appropriate anchorage points and attachment techniques been reviewed?

7.1.4 Has free fall distance been considered so that a worker will not strike a lower surface or object before the fall is arrested?

7.1.5 Have swing fall hazards been eliminated?

7.1.6 Have safe methods to retrieve fallen workers been planned?

7.1.7 Has the full-body harness and all of its components been inspected both before each use and on a regular semi-annual basis?

7.1.8 Is any of the equipment, including lanyards, connectors, and lifelines, subject to such problems as welding damage, chemical corrosion, or sandblasting operations?

7.2 Retractable Lifelines

7.2.1 A retractable lifeline is a fall arrest device used in conjunction with other components of a fall arrest system. Retractable lifelines should be used by one person at a time.

7.2.2 A properly inspected and maintained retractable lifeline, when correctly installed and used as part of the fall arrest system, automatically stops a person's descent in a short distance after the onset of an accidental fall.

7.2.3 Retractable lifelines may be considered when working in areas such as on roofs and scaffolds, or in tanks, towers, vessels, and manholes. Also, retractable lifelines should be considered when climbing such equipment as vertical fixed ladders. Before using a retractable lifeline, the supervisor and/or the user must address the following questions:

7.2.3.1 Has the user been trained to use a retractable lifeline correctly?

7.2.3.2 Is the retractable lifeline being used in conjunction with a complete fall arrest system?

7.2.3.3 Is the equipment under a regular maintenance program?

7.2.3.4 Has the equipment been inspected within the last six months?

7.3 Standard Harnesses. Harnesses for general purpose work should be Class III, constructed with a sliding back D-ring. Standard harnesses are suitable for continuous fall protection while climbing, riding, or working on elevated personnel platforms. They are suitable for positioning, fall arrest, and the rescue and evacuation of people who are working at elevated heights.

8. Inspection and Maintenance. To ensure that fall protection systems are ready and able to perform their required tasks, a program of inspection and maintenance will be implemented and maintained. The following as a minimum, will comprise the basic requirements of the inspection and maintenance program:

8.1 Equipment manufacturer's instructions will be incorporated into the inspection and preventive maintenance procedures.

8.2 All fall protection equipment will be inspected prior to each use, and a documented inspection at intervals not to exceed 6 months, or in accordance with the manufacturers guidelines.

8.3 The user will inspect his/her equipment prior to each use and check the inspection date.

8.4 Any fall protection equipment subjected to a fall or impact load, will be removed from service immediately and inspected by a qualified person (sent back to the manufacturer).

8.5 Check all equipment for mold, damage, wear, mildew, or distortion.

8.6 Hardware should be free of cracks, sharp edges, or burns.

8.7 Ensure that no straps are cut, broken, torn or scraped.

8.8 Special situations such as radiation, electrical conductivity, and chemical effects will be considered.

8.9 Equipment that is damaged or in need of maintenance will be tagged as unusable, and ***will not be stored*** in the same area as serviceable equipment.

8.10 A detailed inspection policy will be used for equipment stored for periods exceeding one month.

8.11 Anchors and mountings will be inspected before each use by the user and supervisor for signs of damage.

9. Most Common and Most Dangerous Fall Hazards. The tasks and situations listed below present inherent fall hazards. Give special attention to providing fall prevention and/or fall control for them, remembering that this attention is necessary in the design, engineering, planning, and execution stages of work. Supervisors will give special consideration to fall protection for the following tasks:

9.1 Working from crane booms and tower cranes.

9.2 Working on top of machinery and equipment, such as overhead cranes, furnaces, conveyors and presses.

9.3 Other work that involves fall hazards, such as 'off-chutes' from main piping in duct work or boilers.

9.4 Working on roofs, with deteriorating or unsupported sections and framing.

9.5 Working over chemical tanks or open pits.

9.6 Working from a fixed or portable ladders, or climbing systems.

9.7 Performing work on water towers, product tanks, silos, pipe racks, presses, and floor pits.

10. Contractor Responsibilities. In addition to complying with the fall protection requirements that apply to all company employees, each contractor who is retained to perform operations that involve fall protection will:

10.1 Obtain any available information regarding fall hazards and protective measures from this company.

10.2 Coordinate fall protection operations with the company, when both company personnel and contractor personnel will be working in or near recognized fall hazard locations.

10.3 Inform the company of the fall protection program that the contractor will follow and of any hazards confronted or created in conducting operations involving fall protection within company owned facilities through a debriefing immediately prior to the operation.

11. Definitions

Anchorage means a secure point of attachment for lifelines, lanyards or deceleration devices.

Body belt means a strap with means both for securing it about the waist and for attaching it to a lanyard, lifeline, or deceleration device.

Body harness means straps which may be secured about the employee in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders with means for attaching it to other components of a personal fall arrest system.

Competent person means a person who is capable of identifying hazardous or dangerous conditions in any personal fall arrest system or any component thereof, as well as in their application and use with related equipment.

Connector means a device which is used to couple (connect) parts of the personal fall arrest system and positioning device systems together. It may be an independent component of the system, such as a carabiner, or it may be an integral component of part of the system.

Deceleration device means any mechanism with a maximum length of 3.5 feet, such as a rope grab, ripstitch lanyard, tearing or deforming lanyards, self-retracting lifelines, etc. which serves to dissipate a substantial amount of energy during a fall arrest, or otherwise limit the energy imposed on an employee during fall arrest.

Energy shock absorber means a device that limits shock-load forces on the body.

Failure means load refusal, breakage, or separation of component parts. Load refusal is the point where the ultimate strength is exceeded.

Fall arrest system means a system specifically designed to secure, suspend, or assist in retrieving a worker in or from a hazardous work area. The basic components of a fall arrest system include anchorage, anchorage connector, lanyard, shock absorber, harness, and self-locking snap hook.

Free fall means the act of falling before a personal fall arrest system begins to apply force to arrest the fall.

Free fall *distance* means the vertical displacement of the fall arrest attachment point on the employee's body belt or body harness between onset of the fall and just before the system begins to apply force to arrest the fall (maximum of 6 feet). This distance excludes deceleration distance, and lifeline/lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before they operate and fall arrest forces occur.

Hole means a gap or void 2 inches or more in its least dimension, in a floor, roof, or other walking/working surface.

Lanyard means a flexible line of rope, wire rope, or strap which generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline or anchorage.

Leading edge means the edge of a floor roof, or formwork for a floor or other walking/working surface which changes location as additional floor, roof, decking, or formwork sections are placed, formed or constructed. A leading edge is considered to be an unprotected side and edge during periods when it is not actively and continuously under construction.

Lifeline means a component consisting of a flexible line for connection to an anchorage at one end to hang vertically or for connection to anchorages at both ends to stretch horizontally and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.

Opening means a gap or void 30 inches or more high and 18 inches or more wide, in a wall or partition, through which employees can fall to a lower level.

Personal fall arrest system means a system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body belt or body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these. As of January 1, 1998, the use of a body belt for fall arrest is prohibited.

Positioning device system means a body belt or body harness system rigged to allow an employee to be supported on an elevated vertical surface, such as a wall, and work with both hands free while leaning.

Qualified person means one with a recognized degree or professional certificate and extensive knowledge and experience in the subject field who is capable of design, analysis, evaluation and specifications in the subject work, project, or product.

Retractable lifeline means a fall arrest device that allows free travel without slack rope, but locks instantly when a fall begins.

Rope grab means a deceleration device which travels on a lifeline and automatically, by friction, engages the lifeline and locks so as to arrest the fall of an employee. A rope grab usually employs the principle of inertial locking, cam/level locking, or both.

Safety-monitoring system means a safety system in which a competent person is responsible for recognizing and warning employees of fall hazards.

Self-retracting lifeline/lanyard means a deceleration device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which, after onset of a fall, automatically locks the drum and arrests the fall.

Snaphook means a connector comprised of a hook-shaped member with a normally closed keeper, or similar arrangement, which may be opened to permit the hook to receive an object and, when released, automatically closes to retain the object. Snaphooks are generally one of two types:

- The locking type with a self-closing , self-locking keeper which remains closed and locked until unlocked and pressed open for connection or disconnection; or

- The non-locking type with a self-closing keeper which remains closed until pressed open for connection or disconnection. As of January 1, 1998, the use of a non-locking snaphook as part of personal fall arrest systems and positioning device systems is prohibited.

Toeboard means a low protective barrier that will prevent the fall of materials and equipment to lower levels and provide protection from falls for personnel.

Walking/Working surface means any surface, whether horizontal or vertical on which an employee walks or works, including, but not limited to, floors, roofs, ramps, bridges, runways, formwork and concrete reinforcing steel but not including ladders, vehicles, or trailers, on which employees must be located in order to perform their job duties.

Warning line system means a barrier erected on a roof to warn employees that they are approaching an unprotected roof side or edge, and which designates an area in which roofing work may take place without the use of guardrail, body belt, or safety net systems to protect employees in the area.

Work area means that portion of a walking/working surface where job duties are being performed.

APPENDIX H

Fall Protection Plan

T N & Associates, Inc.
Operation and Maintenance of Dual Phase Groundwater and Vapor Phase Treatment System
Pemaco Superfund Site
Accident Prevention Plan –
Section 12.26 Fall Protection Plan (SECTION 21)

STANDARD PRACTICE INSTRUCTION

SUBJECT: Fall Protection Program

REGULATORY STANDARDS:

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- OSHA - 29 CFR 1910.66
- 29 CFR 1910.128, 129, 130, 131, (Proposed)
- 29 CFR 1926.104
- 29 CFR 1926.500
- Equivalent CalOSHA standards

BASIS: Approximately 300,000 disabling injuries occur in work-related falls each year. 85% of workers surviving falls lose time from their jobs. This poses a serious problem for exposed workers and their employer. The OSHA Safety Standards establish uniform requirements to make sure that the hazards elevated falls in U.S. workplaces are evaluated, and that this hazard information is transmitted to all affected workers.

GENERAL: This Company will ensure that the hazards of all elevated falls over 6 feet in length, within our facilities are evaluated, and that information concerning their hazards is transmitted to all employees. This standard practice instruction is intended to address comprehensively the issues of; evaluating potential fall hazards, communicating information concerning these hazards, and establishing appropriate protective measures for employees.

RESPONSIBILITY: The SITE MANAGER/SSHO is responsible for the administration of this program and has full authority to make necessary decisions to ensure success of the program. All site personnel are responsible for safety at all times. This company has expressly authorized this person to halt any company operation where there is danger of serious personal injury.

Contents of the Fall Protection Program

Fall Protection Program

1. Written Program. The company will review and evaluate this standard practice instruction:

- On an annual basis
- When changes occur to USACE EM 385-1-1, 29 CFR and CalOSHA standards, that prompt revision of this document
- When facility operational changes occur that require a revision of this document
- When there is an accident or close-call that relates to this area of safety
- Review the program any time fall protection procedures fail

Effective implementation of this program requires support from all levels of management within this company. This written program will be communicated to all personnel that are affected by it. It encompasses the total workplace, regardless of the number of workers employed or the number of work shifts. It is designed to establish clear goals, and objectives.

2. Statement of Policy. The hazards of potential falls at heights of 6 feet and above will be addressed in this document. This instruction describes a systematic approach that must be used to protect and prevent people from falling. This instruction also lists some of the most common fall hazards, and provides recommendations and guidelines for selecting fall arrest systems.

3. Facility/Department Evaluation. The workplace will be assessed before each assigned job for potential fall hazards. Proper fall arrest equipment will be used for jobs requiring fall protection when elimination of the hazard(s) is not possible. This company will evaluate the facilities by department to determine fall hazards. This preliminary evaluation will detail the required steps for protecting employees from fall hazards. A fall hazards assessment sheet (see appendix) will be used to document fall hazard assessments. A complete list of fall hazard locations and protective measures procedures will be maintained.

Pemaco Superfund Site Fall Hazard Location List

Department	Specific Fall Hazard Location	Date Evaluated	Remarks
Treatment Bldg	**Liquid system GAC change out; Overhead piping work; FTO scrubber stack removal and; Subsequent roof repair**	**July 2007**	

4. Training. A training program will be provided for all employees who will be exposed to fall hazards in the work area, and will be conducted by competent personnel. The program will include but will not be limited to:

- A description of fall hazards in the work area
- Procedures for using fall prevention and protection systems
- Equipment limitations
- The elements encompassed in total fall distance
- Prevention, control and fall arrest systems
- Inspection and storage procedures for the equipment

Generally, workers will be trained to recognize the hazards of falling from elevations and to avoid falls from grade level to lower levels through holes or openings in walking/working surfaces. Training programs will include prevention, control and fall arrest systems. It must be ensured that appropriate fall arrest systems are installed, and that employees know how to use them before beginning any work that requires fall protection.

4.1 Initial training. Training will be conducted prior to job assignment. This employer will provide training to ensure that the purpose, function, and proper use of fall protection is understood by employees and that the knowledge and skills required for the safe application, and usage is acquired by employees. This standard practice instruction will be provided to, and read by all employees receiving training. The training will include, as a minimum the following:

4.1.1 Types of fall protection equipment appropriate for use.

4.1.2 Recognition of applicable fall hazards associated with the work to be completed and the locations of such.

4.1.3 Load determination and balancing requirements.

4.1.4 Procedures for removal of protection devices from service for repair or replacement.

4.1.5 All other employees whose work operations are or may be in an area where fall protection devices may be utilized, will be instructed to an awareness level concerning hazards associated with fall protection operations.

4.1.6 Fall protection equipment identification. Fall protection equipment having identification numbers will be checked for legibility. Fall protection equipment having illegible identification markings will be turned in to the supervisor for inspection.

4.1.7 Equipment maintenance and inspection requirements.

4.1.8 Equipment donning and doffing procedures.

4.1.9 Equipment strengths and limitations.

4.1.10 Certification. This employer will certify that employee training has been accomplished and is being kept up to date. The certification will contain each employee's name and dates of training. Training will be accomplished by competent personnel.

4.2 Refresher training. This standard practice instruction will be provided to, and read by all employees receiving refresher training. The training content will be identical to initial training. Refresher training will be conducted on a semi-annual basis or when the following conditions are met, whichever event occurs sooner.

4.2.1 Retraining will be provided for all authorized and affected employees whenever (and prior to) a change in their job assignments, a change in the type of fall protection equipment used, or when a known hazard is added to the work environment which affects the fall protection program.

4.2.2 Additional retraining will also be conducted whenever a periodic inspection reveals, or whenever this employer has reason to believe, that there are deviations from or inadequacies in the employee's knowledge or use of fall protection equipment or procedures.

4.2.3 Whenever a fall protection procedure fails.

4.2.4 The retraining will reestablish employee proficiency and introduce new or revised methods and procedures, as necessary.

4.2.5 Certification. This employer will certify that employee training has been accomplished and is being kept up to date. The certification will contain each employee's name and dates of training. Training will be accomplished by competent personnel.

5. Fall Hazard Control Procedures (Fall Prevention).

5.1 Control Procedures Development. Once a facility evaluation has been accomplished, procedures will be developed, documented and utilized for the control of potential fall hazards. Fall prevention plans will be designed by company competent individuals or other competent personnel. Company engineers (where utilized) or other competent personnel will be provided with any required specialized training to recognize fall hazards, to understand and address fall prevention techniques, and to become familiar with fall arrest equipment and procedures. It is critical that they consider fall protection design for the safety of operations where employees must work at elevated heights. Safety during access and egress from elevated work sites will also be considered. The following guidelines will be used when planning work at elevated heights:

- Involve the Safety Department early in the project planning/job planning so that they can recommend appropriate fall-protection measures and equipment.

- Involve qualified Engineers when load rating of anchorage points must be determined or is in doubt. Required training will be provided as necessary.

- Involve Engineering and Maintenance when anchorage points must be installed.

- The Safety Officer and Engineering Departments will use the expertise of fall protection equipment manufacturers such as Rose Manufacturing Company., Miller Equipment Company, Research and Trading Company and DBI/SALA.

- This Company will be specific in dealing with fall hazards when developing contracts. Contractors will be required to provide a written fall protection program which describes the Contractors' fall protection policies and procedures when they will be working at elevated heights.

5.2 Procedural Format. The following format will be followed when developing fall protection procedures. The Safety Officer will be responsible for the implementation of these procedures. The procedures will clearly and specifically outline the scope, purpose, authorization, rules, and techniques to be utilized to control fall hazards, and the means to enforce compliance including, but not limited to, the following:

5.2.1 A specific statement of the intended use of the procedure.

5.2.2 A review of accident records, including OSHA 300 logs and Workers' Compensation documentation.

5.2.3 Interviews with employees and groups of employees whose work environment includes or may include fall hazards.

5.2.4 Physical observations of the work environment(s) that involve fall hazards or the potential of such.

5.2.5 Observations of individuals and their job tasks and work habits that expose them to existing or potential fall hazards.

5.2.6 The procedures contained in the company fall protection program.

5.2.7 Specific procedural steps for the use and operation of body harness systems, and other fall protection systems.

5.2.8 Specific procedural steps for the placement, erection, inspection, maintenance, disassembly and transfer of fall protection systems or devices and the person(s) responsible for them.

5.2.9 Specific requirements for testing fall protection systems or equipment to determine and verify the effectiveness of the fall protection control measures (not load testing).

5.2.10 The correct procedures to rescue employees who have fallen.

5.2.11 The role of each employee in fall protection plans and applicable policies.

5.2.12 Specific requirements for testing fall protection systems or equipment.

6. **Protective Materials and Hardware**. Appropriate fall protection devices will be provided for potential fall hazards. Selection of the equipment will be based on the fall protection evaluation. Evaluations will be conducted by the following personnel authorized to evaluate fall protection requirements:

Duty Title

1. John Wingate, PE, TN&A Construction Superintendent/Quality Control Manager

2.Mark Prostko, O&M System Site Manager/SSHO

3. William S. Fink, CIH, CSP, CHMM, TN&A Corporate Health and Safety Manager/Associate

6.1 Selection Criteria.

6.1.1 Fall Protection devices will be singularly identified; will be the only devices(s) used for controlling falls; will not be used for other purposes; and will meet the following requirements:

6.1.1.1 Capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected.

6.1.1.2 Anchor points will not deteriorate when located in corrosive environments such as areas where acid and alkali chemicals are handled and stored.

6.1.1.3 Capable of withstanding the ultimate load of 5,000 lbs. for the maximum period of time that exposure is expected.

6.1.1.4 Standardization within company facilities. Fall protection devices will be standardized whenever possible.

7. Fall Protection Systems. When fall hazards cannot be eliminated through any other means, fall arrest systems will be used to control falls. Proper training on the use of fall arrest equipment is essential and will be provided prior to use.

7.1 Full Body Harness Systems. A full body harness system consists of a full-body harness, lanyard, energy shock absorber, and self-locking snap hook. Before using a full-body harness system, the supervisor and/or the user must address such issues as:

7.1.1 Has the user been trained to recognize fall hazards and to use fall arrest systems properly?

7.1.2 Are all components of the system compatible according to the manufacturer's instructions?

7.1.3 Have appropriate anchorage points and attachment techniques been reviewed?

7.1.4 Has free fall distance been considered so that a worker will not strike a lower surface or object before the fall is arrested?

7.1.5 Have swing fall hazards been eliminated?

7.1.6 Have safe methods to retrieve fallen workers been planned?

7.1.7 Has the full-body harness and all of its components been inspected both before each use and on a regular semi-annual basis?

7.1.8 Is any of the equipment, including lanyards, connectors, and lifelines, subject to such problems as welding damage, chemical corrosion, or sandblasting operations?

7.2 Retractable Lifelines

7.2.1 A retractable lifeline is a fall arrest device used in conjunction with other components of a fall arrest system. Retractable lifelines should be used by one person at a time.

7.2.2 A properly inspected and maintained retractable lifeline, when correctly installed and used as part of the fall arrest system, automatically stops a person's descent in a short distance after the onset of an accidental fall.

7.2.3 Retractable lifelines may be considered when working in areas such as on roofs and scaffolds, or in tanks, towers, vessels, and manholes. Also, retractable lifelines should be considered when climbing such equipment as vertical fixed ladders. Before using a retractable lifeline, the supervisor and/or the user must address the following questions:

7.2.3.1 Has the user been trained to use a retractable lifeline correctly?

7.2.3.2 Is the retractable lifeline being used in conjunction with a complete fall arrest system?

7.2.3.3 Is the equipment under a regular maintenance program?

7.2.3.4 Has the equipment been inspected within the last six months?

7.3 Standard Harnesses. Harnesses for general purpose work should be Class III, constructed with a sliding back D-ring. Standard harnesses are suitable for continuous fall protection while climbing, riding, or working on elevated personnel platforms. They are suitable for positioning, fall arrest, and the rescue and evacuation of people who are working at elevated heights.

8. Inspection and Maintenance. To ensure that fall protection systems are ready and able to perform their required tasks, a program of inspection and maintenance will be implemented and maintained. The following as a minimum, will comprise the basic requirements of the inspection and maintenance program:

8.1 Equipment manufacturer's instructions will be incorporated into the inspection and preventive maintenance procedures.

8.2 All fall protection equipment will be inspected prior to each use, and a documented inspection at intervals not to exceed 6 months, or in accordance with the manufacturers guidelines.

8.3 The user will inspect his/her equipment prior to each use and check the inspection date.

8.4 Any fall protection equipment subjected to a fall or impact load, will be removed from service immediately and inspected by a qualified person (sent back to the manufacturer).

8.5 Check all equipment for mold, damage, wear, mildew, or distortion.

8.6 Hardware should be free of cracks, sharp edges, or burns.

8.7 Ensure that no straps are cut, broken, torn or scraped.

8.8 Special situations such as radiation, electrical conductivity, and chemical effects will be considered.

8.9 Equipment that is damaged or in need of maintenance will be tagged as unusable, and ***will not be stored*** in the same area as serviceable equipment.

8.10 A detailed inspection policy will be used for equipment stored for periods exceeding one month.

8.11 Anchors and mountings will be inspected before each use by the user and supervisor for signs of damage.

9. Most Common and Most Dangerous Fall Hazards. The tasks and situations listed below present inherent fall hazards. Give special attention to providing fall prevention and/or fall control for them, remembering that this attention is necessary in the design, engineering, planning, and execution stages of work. Supervisors will give special consideration to fall protection for the following tasks:

9.1 Working from crane booms and tower cranes.

9.2 Working on top of machinery and equipment, such as overhead cranes, furnaces, conveyors and presses.

9.3 Other work that involves fall hazards, such as 'off-chutes' from main piping in duct work or boilers.

9.4 Working on roofs, with deteriorating or unsupported sections and framing.

9.5 Working over chemical tanks or open pits.

9.6 Working from a fixed or portable ladders, or climbing systems.

9.7 Performing work on water towers, product tanks, silos, pipe racks, presses, and floor pits.

10. Contractor Responsibilities. In addition to complying with the fall protection requirements that apply to all company employees, each contractor who is retained to perform operations that involve fall protection will:

10.1 Obtain any available information regarding fall hazards and protective measures from this company.

10.2 Coordinate fall protection operations with the company, when both company personnel and contractor personnel will be working in or near recognized fall hazard locations.

10.3 Inform the company of the fall protection program that the contractor will follow and of any hazards confronted or created in conducting operations involving fall protection within company owned facilities through a debriefing immediately prior to the operation.

11. Definitions

Anchorage means a secure point of attachment for lifelines, lanyards or deceleration devices.

Body belt means a strap with means both for securing it about the waist and for attaching it to a lanyard, lifeline, or deceleration device.

Body harness means straps which may be secured about the employee in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders with means for attaching it to other components of a personal fall arrest system.

Competent person means a person who is capable of identifying hazardous or dangerous conditions in any personal fall arrest system or any component thereof, as well as in their application and use with related equipment.

Connector means a device which is used to couple (connect) parts of the personal fall arrest system and positioning device systems together. It may be an independent component of the system, such as a carabiner, or it may be an integral component of part of the system.

Deceleration device means any mechanism with a maximum length of 3.5 feet, such as a rope grab, ripstitch lanyard, tearing or deforming lanyards, self-retracting lifelines, etc. which serves to dissipate a substantial amount of energy during a fall arrest, or otherwise limit the energy imposed on an employee during fall arrest.

Energy shock absorber means a device that limits shock-load forces on the body.

Failure means load refusal, breakage, or separation of component parts. Load refusal is the point where the ultimate strength is exceeded.

Fall arrest system means a system specifically designed to secure, suspend, or assist in retrieving a worker in or from a hazardous work area. The basic components of a fall arrest system include anchorage, anchorage connector, lanyard, shock absorber, harness, and self-locking snap hook.

Free fall means the act of falling before a personal fall arrest system begins to apply force to arrest the fall.

Free fall *distance* means the vertical displacement of the fall arrest attachment point on the employee's body belt or body harness between onset of the fall and just before the system begins to apply force to arrest the fall (maximum of 6 feet). This distance excludes deceleration distance, and lifeline/lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before they operate and fall arrest forces occur.

Hole means a gap or void 2 inches or more in its least dimension, in a floor, roof, or other walking/working surface.

Lanyard means a flexible line of rope, wire rope, or strap which generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline or anchorage.

Leading edge means the edge of a floor roof, or formwork for a floor or other walking/working surface which changes location as additional floor, roof, decking, or formwork sections are placed, formed or constructed. A leading edge is considered to be an unprotected side and edge during periods when it is not actively and continuously under construction.

Lifeline means a component consisting of a flexible line for connection to an anchorage at one end to hang vertically or for connection to anchorages at both ends to stretch horizontally and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.

Opening means a gap or void 30 inches or more high and 18 inches or more wide, in a wall or partition, through which employees can fall to a lower level.

Personal fall arrest system means a system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body belt or body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these. As of January 1, 1998, the use of a body belt for fall arrest is prohibited.

Positioning device system means a body belt or body harness system rigged to allow an employee to be supported on an elevated vertical surface, such as a wall, and work with both hands free while leaning.

Qualified person means one with a recognized degree or professional certificate and extensive knowledge and experience in the subject field who is capable of design, analysis, evaluation and specifications in the subject work, project, or product.

Retractable lifeline means a fall arrest device that allows free travel without slack rope, but locks instantly when a fall begins.

Rope grab means a deceleration device which travels on a lifeline and automatically, by friction, engages the lifeline and locks so as to arrest the fall of an employee. A rope grab usually employs the principle of inertial locking, cam/level locking, or both.

Safety-monitoring system means a safety system in which a competent person is responsible for recognizing and warning employees of fall hazards.

Self-retracting lifeline/lanyard means a deceleration device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which, after onset of a fall, automatically locks the drum and arrests the fall.

Snaphook means a connector comprised of a hook-shaped member with a normally closed keeper, or similar arrangement, which may be opened to permit the hook to receive an object and, when released, automatically closes to retain the object. Snaphooks are generally one of two types:

- The locking type with a self-closing , self-locking keeper which remains closed and locked until unlocked and pressed open for connection or disconnection; or

- The non-locking type with a self-closing keeper which remains closed until pressed open for connection or disconnection. As of January 1, 1998, the use of a non-locking snaphook as part of personal fall arrest systems and positioning device systems is prohibited.

Toeboard means a low protective barrier that will prevent the fall of materials and equipment to lower levels and provide protection from falls for personnel.

Walking/Working surface means any surface, whether horizontal or vertical on which an employee walks or works, including, but not limited to, floors, roofs, ramps, bridges, runways, formwork and concrete reinforcing steel but not including ladders, vehicles, or trailers, on which employees must be located in order to perform their job duties.

Warning line system means a barrier erected on a roof to warn employees that they are approaching an unprotected roof side or edge, and which designates an area in which roofing work may take place without the use of guardrail, body belt, or safety net systems to protect employees in the area.

Work area means that portion of a walking/working surface where job duties are being performed.